

Proposed Mitigated Negative Declaration
Winter Island Tidal Habitat Restoration Project

Lead Agency: California Department of Water Resources (DWR), 3500 Industrial Blvd., West Sacramento 95691.

Availability of Documents: DWR, in conjunction with the Department of Fish and Wildlife (CDFW), has prepared a draft Initial Study in support of this Mitigated Negative Declaration. Copies of the draft Initial Study are provided to the State Clearinghouse on August 10, 2018 initiating a 30-day review period.

Project Location: The Winter Island Tidal Habitat Restoration Project (Project) is located at the northern edge of Contra Costa County, California at the confluence of the Sacramento and San Joaquin rivers in the western Delta (Latitude 38.041698, Longitude -121.846703). The 544.37 acres Project area includes the main island and a non-contiguous northern island; however, construction activities would not occur on the northern island. Winter Island is bordered to the north by the Sacramento River, east by Broad Slough, south by New York Slough, and west by Middle Slough. The Project is within the Antioch North 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle.

Project Summary: The Project is a tidal restoration project proposed by DWR in the central San Francisco-San Joaquin Delta (Delta). The Project area is predominately made up of muted tidal wetlands with a central island channel, all of which is enclosed by a levee system. Water flow within the Project area is controlled by two water control structures located at the northern and southern ends of Winter Island. Water also enters the Project area through a breach on the eastern side of the island. The proposed Project would include the removal of the water control structures and excavation of an eastern channel to reestablish full tidal connections to the existing marsh and surrounding waterways and enhance aquatic and wetland habitat. Temporary, construction-related, impacts would be avoided by working within appropriate work windows, having a qualified biologist on site during construction activities, and implementing best management practices (BMPs). The proposed Project is expected to benefit listed fish species including Delta Smelt (*Hypomesus transpacificus*), Chinook Salmon (*Oncorhynchus tshawytscha*), and Longfin Smelt (*Spirinchus thaleichthys*), and may provide enhanced nesting and foraging habitat for species such as California black rail (*Laterallus jamaicensis coturniculus*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), and Suisun song sparrow (*Melospiza melodia maxillaris*). Restoration of the Project area would result in the conversion of all muted tidal habitat into fully tidal habitat, and the conversion of 0.4 acres of upland habitat into 0.1 acres of tidal emergent marsh and 0.3 acres of tidal open water habitat.

Findings: The Initial Study has been prepared to determine if the Project could have a significant effect on the environment. Based on the Initial Study, it has been determined that the Project would not have any significant effects on the environment after implementation of mitigation measures. The mitigation measures identified in the Initial Study and a Mitigation

Monitoring and Reporting Plan will be adopted to ensure compliance with the required mitigation measures. This conclusion is supported by the following findings:

- The Project would result in no impacts to Agriculture and Forest Resources, Land use and Planning, Mineral Resources, Populations and Housing, Public Services, and Utilities and Service Systems.
- The Project would result in less than significant impacts to Aesthetics, Air Quality, Geology and Soils, Greenhouse Gas Emissions, Noise, Recreation, and Transportation and Traffic.
- With the implementation of mitigation measures, the proposed Project would have less than significant impacts on Biological Resources, Cultural Resources, Hazards and Hazardous Materials, Hydrology and Water Quality, and Mandatory Findings of Significance.

Mitigation Measures: The following mitigation measures will be implemented by DWR to avoid, minimize, or mitigate for potential environmental impacts. Implementation of these mitigation measures would reduce the potential environmental impacts of the Project to less than significant.

Mitigation Measures for Biological Resources

Mitigation Measure Bio-1: Avoid and minimize impacts to special status plants.

A qualified biologist shall conduct pre-construction surveys for special status plants prior to all construction activities. If special-status plants are identified in the Project area, they shall be flagged and avoided. If any special status plants cannot be avoided, an attempt shall be made to transplant the individuals to suitable habitat after consultation with CDFW.

Mitigation Measure Bio-2: Biological Monitor

A qualified biologist approved by CDFW, U.S. Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS) with appropriate knowledge and experience in the biology, life history, and identification characteristics of fish, wildlife, and plants that are likely to be encountered during Project activities shall be present during all construction activities. This monitor shall also be given the authority to halt any work they deem may be a cause for concern that may endanger fish, wildlife, or plant species or resources.

Mitigation Measure Bio-3: Environmental Awareness Training

Prior to construction activities, all construction personnel would receive environmental awareness training from a qualified biologist approved by CDFW, USFWS, and NMFS. This training shall educate construction personnel in a brief overview of the life history of special-status species that are likely to be encountered on site, legal protections and penalties for unauthorized take, and explain the relevant environmental commitments and mitigation measures.

Mitigation Measure Bio-4: In-Water Work Window

All in-water work shall be limited to August 1 through October 31, a timeframe set by CDFW, USFWS, and NMFS as a time when special status fish are least likely to be present.

Mitigation Measure Bio-5: Western Pond Turtle Surveys

A qualified biologist shall identify suitable western pond turtle habitat and conduct daily surveys for individuals within the construction areas. If a western pond turtle is identified within an area where active construction is occurring, work shall not proceed until the turtle has moved, on its own, out of the area. A qualified biologist may move an individual after receiving permission from CDFW.

Mitigation Measure Bio-6: Breeding and Nesting Bird Avoidance

Site preparation and construction activities shall take place outside of nesting season (February 1–August 31) to avoid disturbance to California black rail, Ridgeway's rail, and other nesting birds. If construction activities must take place during the nesting season, additional minimization and avoidance measures shall be implemented upon consultation with USFWS and CDFW. Ground disturbing activities shall not occur during the nesting season without written approval from regulatory agencies.

Mitigation Measure Bio-7: Salt Marsh Harvest Mouse BMPs

The following BMPs shall be implemented for all phases of the Project:

- A qualified biologist shall identify suitable habitat prior to construction initiation and shall be present on site during all construction activities.
- Disturbance to suitable habitat on levees and upland areas shall be avoided to the extent feasible. All vegetation removal on the levees shall be conducted using hand tools before ground disturbing activities may begin. Vegetation shall be cleared to bare ground or stubble no higher than 1 inch.
- Exclusion fencing shall be installed around all upland construction areas, including the north and south breach locations, after vegetation removal and prior to the initiation of construction activities. The exclusion fencing shall be taut between supporting stakes and buried to a depth of 6 inches. A qualified biologist shall inspect the exclusion fencing daily for holes or tears.
- Vegetation removal and exclusion fencing installation in suitable upland areas shall not occur during extreme high tides (6.5 feet or higher), when mice may be seeking refuge.
- All construction equipment shall be stored within excluded areas or away from suitable habitat when not in use.

Mitigation Measure Bio-8: Construction BMPs

- Construction equipment shall be operated from upland berms, levees, or by barge wherever possible.
- Rip rap shall only be placed as necessary for breach function and armoring.

- Unused riprap, trash, and debris removed during construction activities within wetland habitat shall be disposed of at a Class II or Class III Landfill, depending upon local regulations.

Mitigation Measures for Cultural Resources

Mitigation Measure CR-1: Cultural Awareness Training

Prior to construction activities, all construction personnel would receive cultural resources awareness training. This training may be presented as part of a larger environmental training and shall educate construction personnel on what types of resources are most likely to be encountered in the area, the procedures to follow if cultural resources are observed during construction, and DWR policy concerning the confidentiality of cultural resources information.

Mitigation Measure CR-2: Impacts to Unknown Archaeological Resources

If previously unidentified archaeological materials are unearthed during construction, work will halt within 100 feet of the find until a qualified archaeologist can assess the significance of the resource as required by California Public Resources Code Section 15064.5(f). Should significant or unique archaeological resources be found, the resources shall be treated in compliance with California Public Resources Code Section 21083.2. If the project can be modified to accommodate avoidance, avoidance and preservation in place is the preferred alternative.

Mitigation Measure CR-3: Impacts to Unknown Human Remains

If human remains are found, work will halt within 100 feet and DWR will follow the requirements and procedures of California Public Resources Health and Safety Code Section 7050.5-7055, including immediately stopping work in the vicinity of the find and notification of the Contra Costa County Coroner. The process for notification of the California Native American Heritage Commission (NAHC) and consultation with the individual(s) identified by the NAHC as the "most likely descendent" will be implemented, as set forth in Section 5097.98 of the California Public Resources Code. Work can restart after the remains have been investigated and appropriate recommendations have been made for the treatment and disposition of the remains.

Mitigation Measures for Hazards and Hazardous Materials

Mitigation Measure HM-1: Emergency Response Training and Spill Response Plan

All personnel involved in the use of hazardous materials shall be trained in emergency response and spill control. Diesel fuel and oil shall be used, stored, and disposed of in accordance with standard protocols for the handling of each hazardous material. Contracts shall require contractors to prepare and make available for review by DWR, an Emergency Spill Response Plan.

Mitigation Measure HM-2: Hazardous Material Clean Up

Appropriate spill response materials and procedures shall be present on site to properly respond to a spill or contamination. Soil and water contaminated by any hazardous materials during construction shall be properly cleaned up and disposed of.

Mitigation Measures for Hydrology and Water Quality

Mitigation Measure WQ-1: Minimize Construction Related Turbidity

To minimize turbidity impacts to water quality, the following BMPs shall be implemented for all phases of the Project:

- A silt curtain or similar turbidity control method may be installed and maintained outside of the northern and southern breach construction areas, as necessary, to control the release of suspended sediments.
- In-water work shall be scheduled to occur during low and incoming (flood) tide and equipment shall excavate towards the island interior where feasible.
- Vegetation shall be left in place and undisturbed to the extent possible.
- Upon completion of construction, exposed upland areas would be seeded with native vegetation.

Statement of No Significant Effect: In accordance with Section 21082.1 of the California Environmental Quality Act (CEQA), DWR has independently reviewed and analyzed the Initial Study and Mitigated Negative Declaration for the Project. The Initial Study and proposed Mitigated Negative Declaration reflect the independent judgement of DWR. DWR has determined that adoption of a Mitigated Negative Declaration is appropriate, and that the preparation of an Environmental Impact Report will not be required. DWR has reviewed and responded to comments (Appendix A).

As the lead agency for the Project, DWR finds that the Project mitigation measures will be implemented as stated in the Mitigated Negative Declaration. DWR has adopted a Mitigation Monitoring and Reporting Program to ensure compliance with the required mitigation measures for the Project. With the implementation of these mitigation measures, the Project would have no significant effect on the environment.

I hereby approve these Project activities for the Winter Island Tidal Habitat Restoration Project.

Dean F. Messer, Chief
Division of Environmental Services

Date

Initial Study
Winter Island Tidal Habitat Restoration Project

Lead Agency:

Department of Water Resources
Fish Restoration Program

March 2018

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Acronym	Definition
BAAQMD	Bay Area Air Quality Management District
BiOp	Biological Opinions
BMPs	Best Management Practices
CARB	California Air Resource Board
CEQA	California Environmental Quality Act
CDFW	California Department of Fish and Wildlife
cm	Centimeter
CGS	California Geological Survey
CNDDDB	California Natural Diversity Database
CRHR	California Register of Historical Resources
CVP	Central Valley Project
DMCP	Delta Mercury Control Program
DOC	Department of Conservation
DPS	Distinct population segment
DWR	Department of Water Resources
EC	Electrical conductivity
ESU	Evolutionarily significant unit
FL	Fork length
GGERP	Greenhouse Gas Emission Reduction Program
GHG	Greenhouse Gas
HCP	Habitat Conservation Plan
MeHg	Methylmercury
mm	Millimeter
NAHC	Native American Heritage Commission
NAVD88	North American Vertical Datum 1988
NO _x	Nitrous oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NMFS	National Marine Fisheries Service
NWIC	Northwest Information Center
PM _{2.5}	Fine particulate matter less than or equal to 2.5 micrometers
PM ₁₀	Fine particulate matter less than or equal to 10 micrometers
ppt	Parts per thousand
RBDD	Red Bluff Diversion Dam
ROG	Reactive Organic Gas
RPA	Reasonable and prudent alternative
RWQCB	Regional Water Quality Control Board
SFBAAB	San Francisco Bay Area Air Board
SWP	State Water Project
SWPPP	Stormwater pollution prevention program
SWRCB	State Water Resources Control Board
TL	Tail length
USACE	United State Army Corps of Engineers
uS	Microsiemens
USFWS	United States Fish and Wildlife Service

1 Introduction

1.1 Overview of Project

The Winter Island Tidal Habitat Restoration Project (Project) is a tidal restoration project being pursued by DWR and located on Winter Island in Contra Costa County, California (Figure 1-1). Winter Island is composed of 3 separate parcels: the main island and a smaller northern island to the north separated by a dredge cut, and a 5.91-acres parcel of private property, owned by Winter Island Farms LLC, located at the southern end of the main island. The 544.37-acre Project area includes the main island and the non-contiguous northern island; however, construction activities would not occur on the northern island.

Winter Island was formerly managed for duck hunting and currently receives muted tidal flows from water control structures located at the northern and southern ends of the island and through a breach on the eastern side of the island. It is bordered to the north by the Sacramento River, east by Broad Slough, south by New York Slough, and west by Middle Slough. The Project area is adjacent to the parcel owned by Winter Island Farms to the south and is in close proximity to Brown's Island to the west and the city of Pittsburg to the southwest. DWR is the California Environmental Quality Act Lead Agency for this Project.

The Project would include a suite of actions necessary for site preparation, restoration, and minimizing of potential impacts. Construction of the Project would consist of three project elements:

- Breaching the southern levee. The southern water control structure and bulkhead would be removed and the breach would be widened to accommodate tidal flow.
- Excavating an eastern tidal channel. An existing tidal channel located on the eastern side of the island would be widened to accommodate increased tidal flows.
- Breaching the northern levee. The northern water control structure and bulkhead would be removed to allow tidal exchanges into the north end of the island.

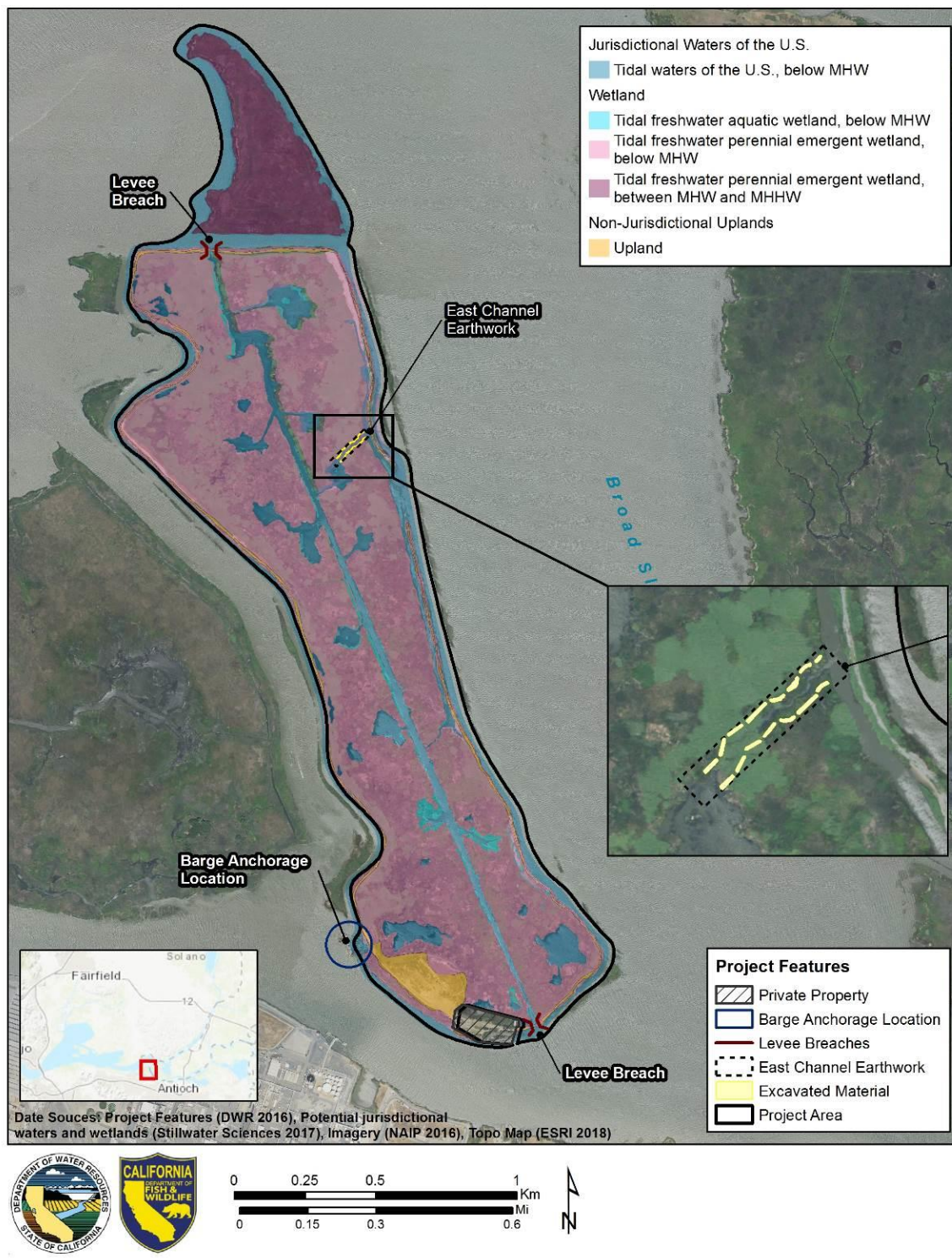


Figure 1-1. Winter Island Tidal Habitat Restoration Project features and site location

1.2 Project Objectives

The Project is intended to fulfill the 8,000-acre tidal habitat restoration obligations of DWR contained within Reasonable and Prudent Alternative (RPA) of the U.S. Fish and Wildlife Service (USFWS) Delta Smelt Biological Opinion (BiOp) for long-term coordinated operations of the State Water Project (SWP) and the federal Central Valley Project (CVP) (USFWS 2008). Because restoration of tidal habitat would provide access for salmonid rearing at Winter Island, the Project would also be consistent with RPA I.6.1 of the National Marine Fisheries Service (NMFS) Salmonid BiOp for SWP/CVP operations (NMFS 2009).

The goal of the Project is to restore unrestricted tidal connectivity between the interior portions of Winter Island and the surrounding channels, converting muted tidal emergent wetland and open water habitats into tidal areas and improving access for the benefit of native fish.

The three Project objectives are to:

1. Enhance available productivity for native fish within and adjacent to the restoration site;
2. Enhance habitat appropriate for spawning and/or rearing salmonids, Delta Smelt, and other native fish species; and
3. Provide connectivity to the marsh plain for migrating salmonids.

Achieving project objectives would result in benefits to special-status species in and around the Project area. Habitat enhancement would provide a larger tidal regime and expand the emergent marsh habitat for use by Delta Smelt (*Hypomesus transpacificus*), Longfin Smelt (*Spirinchus thaleichthys*), and juvenile salmonids, as well as other listed species like California black rail (*Rallus jamaicensis cotumiculus*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), and Suisun song sparrow (*Melospiza melodia maxillaris*). Productivity from increased emergent marsh, and associated high marsh and floodplain, would provide food web benefits to rearing salmonids, Green Sturgeon (*Acipenser medirostris*), Delta Smelt, and Longfin Smelt.

1.3 Project Background and History

Historically, Winter Island was a tidal marsh subject to daily fluctuations in tidal level. Development and human use of the Island began in 1873 under the ownership of William Winter, who constructed a home, barn, and other buildings and used the property as pastureland. From 1893-1901 the island was used as a socialist commune and owned by the co-operative Brotherhood of Winter Island. The Brotherhood built the island's exterior levee, cultivated crops, and grazed livestock until conflicts and lack of funds led the group to default on their mortgage. Following the Brotherhood's failed agricultural pursuits, Winter Island was predominately used for waterfowl hunting and farming purposes. Winter Island is managed by Reclamation District 2122. To address long term levee erosion of the 4.75-mile long perimeter levee, dredged materials have been placed on the island from various sources in the San Francisco Bay-Delta Estuary. In 2016, DWR purchased Winter Island from Winter Island Farms LLC, plus a 6-acre flowage easement on adjacent private land retained by Winter Island Farms LLC. In 2018, DWR purchased a parcel of historically contiguous land that is north of Winter

Island proper; this parcel of land is no longer connected to Winter Island proper but is still considered part of Winter Island as a whole.

1.4 Human Land Use and Infrastructure

A dilapidated barn at the southern end of the island, as well as water control structures at the northern and southern ends of Winter Island, remain within the Project area. A central channel that runs north to south bisects the island. Two sunken barges are located on the eastern side of the island where a former levee breach occurred. These barges were fully permitted when placed.

Winter Island Farms LLC owns a 5.91-acre parcel on the southern end of Winter Island, adjacent to the Project area. The property includes a duck hunting clubhouse, kennels, storage sheds, and the island's only exterior boat dock. In 2016 DWR purchased a 6-acre flowage easement encompassing this parcel.

1.5 Public Use

There is no public use or access on Winter Island. Recreational boating and fishing occurs in the waterways surrounding the island.

1.6 Nearby Municipal Areas

The City of Pittsburg and Antioch are located one mile south of Winter Island. There are several large metropolitan areas within 20 miles of Winter Island including Concord, Martinez, Vallejo, Fairfield, and Walnut Creek.

1.7 Regulatory Requirements, Permits, and Approvals

DWR has the responsibility to ensure that all requirements of CEQA and other applicable regulations are met. Other potential permitting requirements for this Project are listed below:

Federal

- Section 404 of the Federal Clean Water Act through the United States Army Corps of Engineers (USACE).
- Section 7 consultation with USFWS and NMFS to comply with the Federal Endangered Species Act, initiated through USACE.
- Section 106 consultation with the State Historic Preservation Officer to comply with the National Historic Preservation Act, initiated through USACE.

State

- Streambed Alteration Agreement from CDFW pursuant to Section 1602 of the California Fish and Game Code
- Incidental Take Permit from CDFW pursuant to Section 2081(b) of the California Fish and Game Code and Title 14 Section 783.4 of the California Code of Regulations

- Water Quality Certification from the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Federal Clean Water Act
- Construction General Permit to comply with National Pollutant Discharge Elimination System (NPDES) standards from RWQCB pursuant to Section 402 of the Clean Water Act
- Notification of use of State Lands, California State Lands Commission, Memorandum of Understanding dated October 19, 1979 between the State Lands Commission and DWR

Regional/Local

- Certification of Consistency with the Delta Plan from the Delta Stewardship Council

2 Project Description

The proposed Winter Island Tidal Habitat Restoration Project includes elements that would reestablish tidal connections to the existing marsh as well as enhance existing marsh habitat in the Project area. These Project elements include (Figure 1-1):

- Breaching the southern levee. The southern water control structure and bulkhead would be removed and the breach would be widened to accommodate tidal flow.
- Excavating an eastern tidal channel. An existing tidal channel located on the eastern side of the island would be widened to accommodate increased tidal flows.
- Breaching the northern levee. The northern water control structure and bulkhead would be removed to allow tidal exchanges into the north end of the island.

Breaching the southern levee

Under current conditions, the Project area is muted tidal marsh and only receives water from the existing eastern levee breach, and the northern and southern water control structures, when opened. To fully restore tidal connectivity to the site, the southern water control structure and bulkhead would be removed. The resulting breach would be widened to 100 feet and excavated to match the channel invert elevations on the site interior of 2 feet North American Vertical Datum of 1988 (NAVD88). A dilapidated boat dock, shed, post piles, and other debris would be removed and disposed of off-site.

Construction Methods

A barge mounted crane, barge and excavator, or amphibious excavator would be utilized for construction. The culvert, bulkhead, and other debris would be removed and placed on a second barge for proper disposal at a Class II or Class III Landfill, depending upon local regulations. After removing the debris and structures, the southern levee would be excavated down to 2 feet NAVD88 to match interior elevations and widened to 100 feet at the bottom with a 2:1 slope. Excavated soil would be placed on the upland portion of adjacent levees. The slopes of the new breach would be armored with the excavated riprap to protect against erosion.

Breaching the southern levee would require the excavation and side cast of a total of 810 cubic yards of soil, the reuse of 174 tons of riprap for armoring, and permanently convert 0.01 acres of upland scrub habitat and 0.04 of emergent wetland into tidal open-water habitat. A temporary impact of 0.19 acres would occur to upland scrub habitat from the deposition of excavated material.

Excavation of the eastern tidal channel

An existing breach on the eastern side of the Project area is responsible for the muted tidal classification of Winter Island. Incoming water is diverted along the edge of the island interior via a toe ditch, which limits flows to the interior. A narrow channel located just north of the eastern breach would be widened to increase tidal flows to the island interior.

Construction Methods

An amphibious excavator or excavator and barge would be utilized to widen the existing eastern tidal channel. The constructed channel would extend 480 feet to an open water pond within the island's interior, matching the pond's bottom elevations of -0.5 feet NAVD88. The channel would have a 2:1 side slope, 15-foot bottom width, and approximately 25-foot top width. The 1,490 cubic yards of material would be side-casted onto existing wetland between 5 to 6 feet NAVD88, which would remain at intertidal elevation. The mounds would be roughly 75 feet in length and 30 feet wide and have 10 to 20-foot gaps in between each mound to allow for flow into and out of the adjacent wetland.

Excavation of the eastern tidal channel would excavate and sidecast a total of 1,490 cubic yards of soil and permanently convert 0.15 acres of emergent marsh to tidal open-water habitat. A temporary impact of 1.65 acres would occur to emergent marsh habitat from the sidecasting of excavated material into the existing wetland.

Breaching the northern levee

The northern water control structure (culvert and bulkhead), post piles, and other debris would be removed to allow tidal connectivity into the site. The breach would not be further excavated or armored; the northern breach would be allowed to evolve naturally over time.

Construction Methods

A barge mounted crane, barge and excavator, or amphibious excavator would be utilized to remove the northern water control structure. The culvert, wooden bulkhead, and other debris would be removed and disposed of off-site at a Class II or Class III Landfill, depending upon local regulations. A total of 229 cubic yards of excavated soil would be placed on adjacent upland habitat. Removal of the culvert and bulkhead would permanently convert 0.01 acres of upland scrub to tidal open-water habitat. A temporary impact of 0.05 acres would occur to upland scrub habitat from the deposition of material on the levee.

Construction Timeline

Construction would begin September 1 and conclude by October 31. At each location, debris removal would occur before the construction of the Project elements. Construction activities at the southern breach, northern breach, and eastern connector channel may occur simultaneously if practicable.

Future Outcomes

Figure 2-1 depicts the Project area before construction; a muted tidal marsh with small areas of channel and open water habitat surrounded by a thin levee system. Table 2-1 and Figure 2-2 demonstrate how the Project area would look after construction is completed and construction areas have recovered from temporary impacts. The island interior would experience an increased tidal prism, with mean higher high water increasing by 0.65 feet NAVD88 and mean lower low water decreasing by 1.42 feet NAVD88 (Table 2-2).

With restoration completed, the island interior would no longer experience muted tidal flows and a conversion of all muted tidal habitat to tidal habitat would occur. The emergent marsh and open water habitats of Winter Island would be more readily available to fish, and the lower tides would result in the increased export of productivity off-site. Due to the limited upland habitat on Winter Island, the increased tidal prism would result in relatively little change in habitat outside of the conversion from muted-tidal to tidal. Overall, rising tides would convert 0.4 acres of upland scrub habitat to 0.1 acres of tidal emergent marsh habitat and 0.3 acres of tidal open water habitat.

Table 2-1. Impacts and post-restoration habitat conditions for the Winter Island Tidal Habitat Restoration Project

Habitat Type	Classification		Existing	Post-Restoration	Change in Area
Aquatic	Muted-tidal waters of the U.S.		48.4	0.0	-48.4
	Tidal waters of the U.S.		62.4	111.1	48.7
Wetlands	Muted tidal freshwater aquatic wetland		8.8	0.0	-8.8
	Tidal freshwater aquatic wetland		0.0	8.8	8.8
	Muted tidal freshwater perennial emergent wetland		342.7	0.0	-342.7
	Tidal freshwater perennial emergent wetland	Below MHW	14.3	353.8	339.5
		Between MHW and MHHW	50.0	53.3	3.3
Upland			17.7	17.3	-0.4
Total			544.37	544.37	0.00

Table 2-2. Existing and predicted tide levels post-restoration for the Winter Island interior.

	Winter Island Interior ¹ (Existing Conditions)	Winter Island Interior ² (Post-Restoration)
	NAVD88	NAVD88
MHHW	5.39 feet	6.01 feet
MHW	4.87 feet	5.52 feet
MTL	4.04 feet	3.90 feet
MLW	3.20 feet	2.28 feet
MLLW	3.02 feet	1.60 feet
¹ Interior tide range under muted conditions was determined with a deployed water level logger and referenced to nearby tide station at Mallard Island (NOS Station 9415112). ² Interior tide range post-restoration was represented by tidal data at nearby tide stations at Mallard Island		

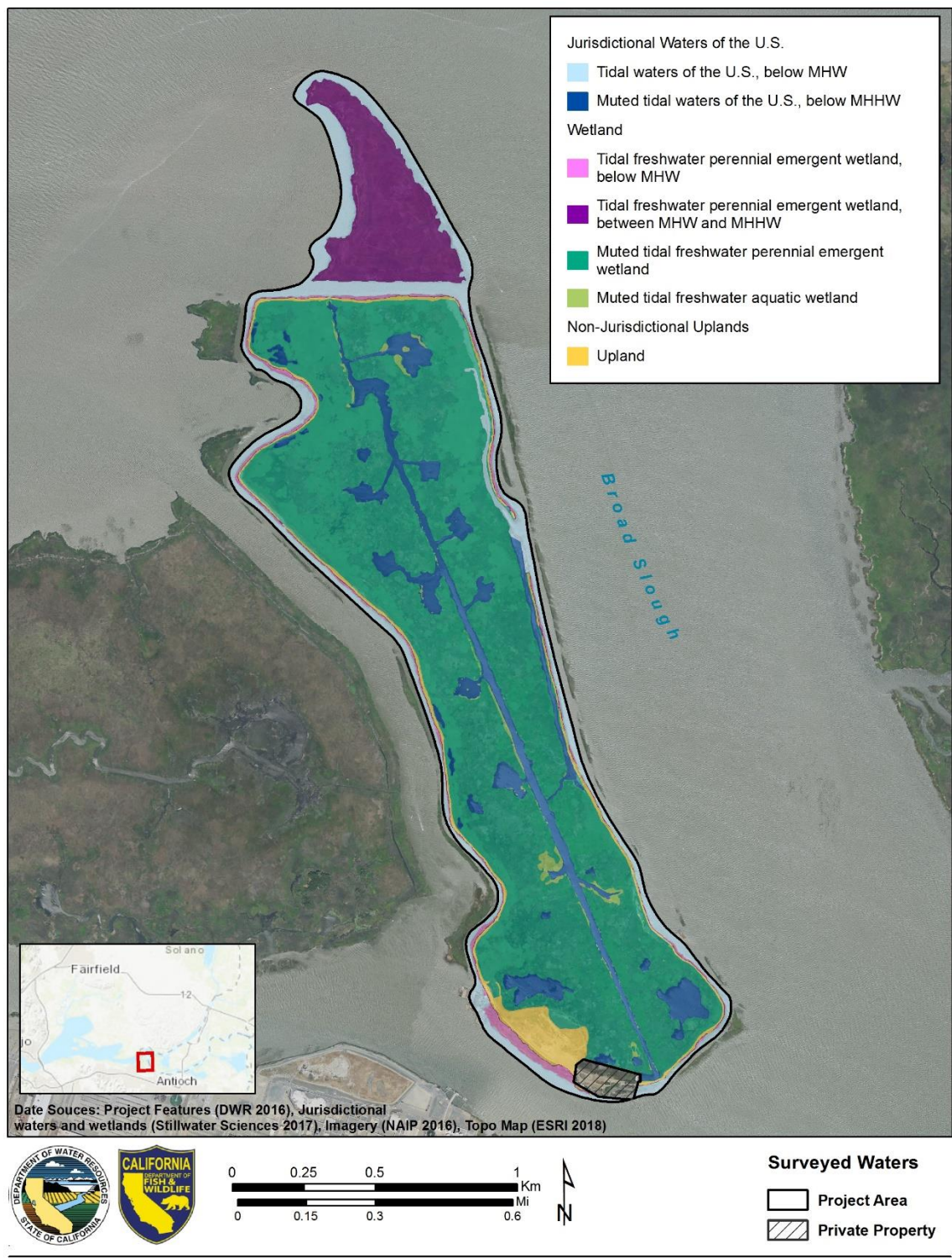


Figure 2-1. Existing conditions of Winter Island.

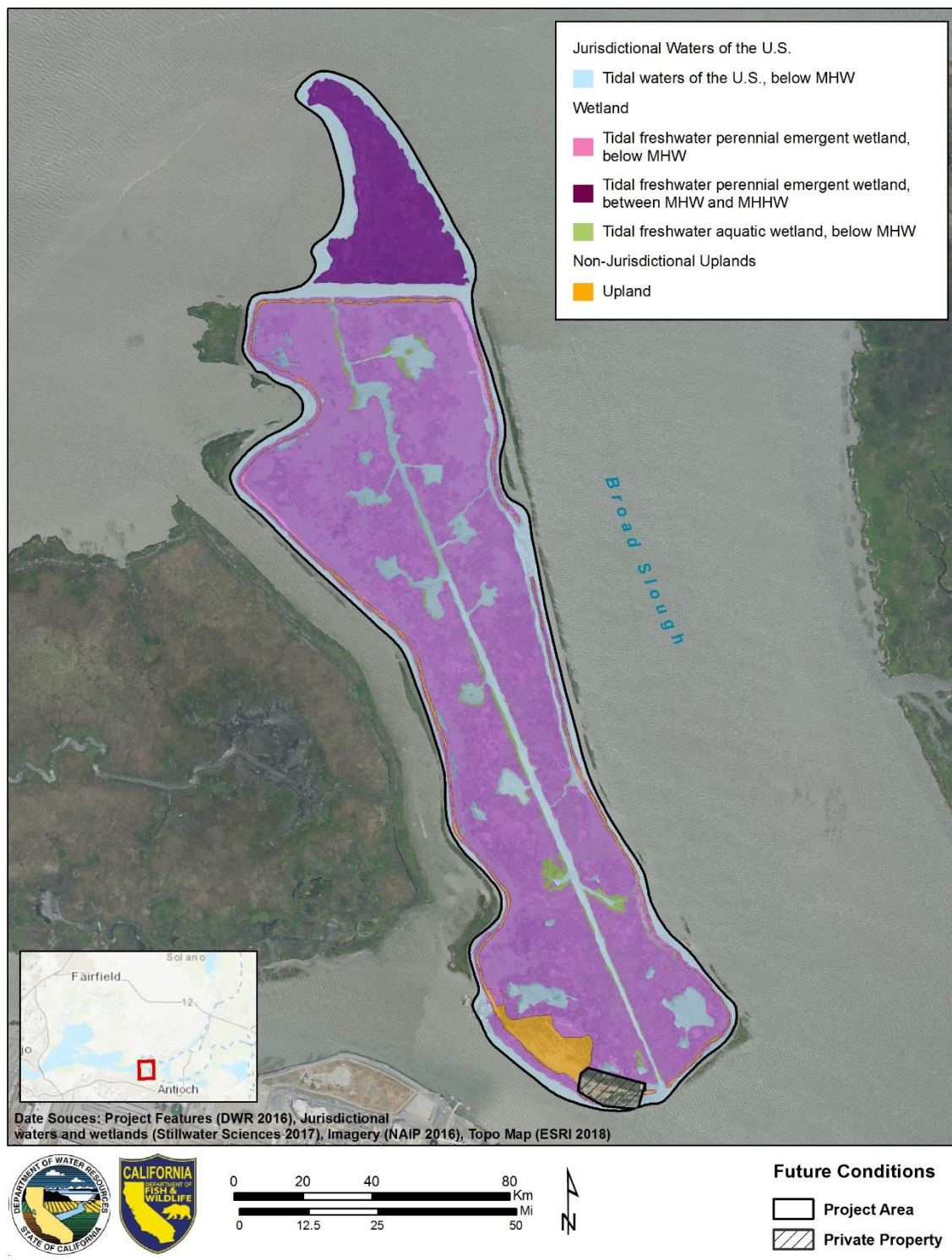


Figure 2-2. Anticipated conditions of the Winter Island Tidal Habitat Restoration Project post-restoration, after temporary impacts have recovered.

3 Environmental Checklist

Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this project as indicated by the checklist on the following pages.

- | | | |
|--------------------------------------|--------------------------------------|---------------------------------|
| - Aesthetics | - Agriculture and Forestry Resources | - Air Quality |
| ✓ Biological Resources | ✓ Cultural Resources | - Geology and Soils |
| - Greenhouse Gas Emissions | ✓ Hazards and Hazardous Materials | ✓ Hydrology and Water Quality |
| - Land Use and Planning | - Mineral Resources | - Noise |
| - Population and Housing | - Public Services | - Recreation |
| - Transportation and Traffic | - Tribal Cultural Resources | - Utilities and Service Systems |
| ✓ Mandatory Findings of Significance | | |

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

- ☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Signature

Date

Signature

Date

3.1 Aesthetics

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?			X	
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

3.1.1 Environmental Setting

Winter Island is isolated from land-based travel and accessible only by boat. Visibility from mainland is also limited; areas of Antioch and Pittsburg with views of Winter Island are privately owned industrial complexes or conserved marsh. Vessels traveling along New York Slough to the south, Middle Slough to the west, Broad Slough to the east, or the Sacramento River to the north have clear views of Winter Island. Views of the island interior are mostly blocked by levees and levee vegetation, but the interior can be accessed by smaller vessels, like those used for recreational fishing, through the existing breach.

3.1.2 Discussion

a) Have a substantial adverse effect on a scenic vista?

Less than significant impact

Barges and equipment utilized for construction would temporarily be visible from adjacent rivers and sloughs. Equipment would be visible for at most two months while construction occurs. Equipment would be stored on barges and anchored overnight at the southwest corner of the island, similar to equipment barges that are seasonally anchored near Winter Island for annual dredge maintenance or construction projects.

After construction, the interior marsh would be more visible due to the breaches created at the northern and southern water control structures. The bulkheads, culverts, and other debris would be removed, creating a more natural and pristine view of the marsh. The temporary use of equipment would not have adverse effects on any scenic vista; impacts would be less than significant.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Less than significant impact

The Project would remove low-quality levee habitat, water control structures, and other debris and replace them with open water aquatic habitat and emergent marsh vegetation. The buildings removed are not considered historic. Impacts would be less than significant.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

No impact

As noted in sections (a) and (b) above, the proposed Project would result in beneficial changes to the existing visual character of the site. The Project would be beneficial to aesthetics and views; there would be no adverse impact.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No impact

No lighting is proposed for the Project and all work would occur during the daytime; there would be no impact.

3.2 Agriculture and Forest Resources

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland)-as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency- to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

3.2.1 Environmental Setting

Winter Island has historically rarely been used for agricultural purposes. A brief attempt at colonization occurred in the late 1800s, with cultivation of crops such as onions, tomatoes, blackberries, and grapes (Contra Costa County Historical Society 2017). Aerial photographs from 1938 depict the development of a dredge cut separating a portion of the island tip from the main portion of Winter Island. The next available photograph in 1993 depicts the dredge cut completely separating the northern island from the main island. Winter Island has been used for duck hunting as well as dredge disposal for the last 15 years (DWR 2017). In 1992, a 25-acre wetland area was restored in the northwestern corner of the main body of the island (RES Associates, Inc. 1991). As of 2014, Winter Island has been classified as other land/open space by the Farmland Mapping and Monitoring Program and is not used for farming (California Department of Conservation [DOC] 2016).

3.2.2 Discussion

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland)-as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency- to non-agricultural use?

No impact

The Contra Costa County Important Farmland Map generated by the Farmland Mapping and Monitoring Program with the DOC (2016) designates the Project area as “Other Land” and is not considered important farmland; therefore, there would be no impact.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No impact

The 2014 Contra Costa County Land Use Elements map designates Winter Island as agricultural lands, but other figures within the Contra Costa County General Plan (2005) designate it as open space. It has been over 100 years since Winter Island was last utilized for agriculture. Furthermore, the proposed Project would not conflict with the agricultural lands designation, as other open space or non-urban uses are allowed in these areas. Soil surveys indicate that the Project area is composed of Joice soils, which easily flood, are highly acidic, and are not conducive to farming practices. In addition, the Contra Costa County Williamson Act map designates Winter Island as “non-enrolled land” and is not protected under the Williamson Act. The Project would not conflict with any established designations or zoning; therefore, there would be no impact.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526)?

No impact

The Project area is not zoned as forest or timberland; therefore, there would be no impact.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No impact

No forest lands are located within the Project area; therefore, there would be no impact.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?

No impact

There is no farmland in the Project area; therefore, there would be no impact.

3.3 Air Quality

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?				X
e) Create objectionable odors affecting a substantial number of people?			X	

3.3.1 Environmental Setting

Winter Island is in the San Francisco Bay Area Air Basin (SFBAAB) managed by the Bay Area Air Quality Management District (BAAQMD). The SFBAAB is divided into eleven sub-regions; Winter Island is within the Contra Costa sub-region. The weather is temperate due to its proximity to water and oceanic air flows. In winter, average daily temperatures are mild, with fog common at night. Average summer temperatures are typically mild overnight and warm during the day, with cooler temperatures and stronger winds more common along the western coast. Wind speeds are generally low throughout the region and winds typically blow from northwest to southwest. However, strong afternoon gusts are common in the northern portion of the county around the Carquinez Strait. Annual rainfall averages between 18 and 23 inches across the county.

Ozone and fine particle pollution, or PM_{2.5}, are the major regional air pollutants of concern in the San Francisco Bay Area. Ozone is primarily a problem in the summer, and fine particle pollution in the winter. Ozone and PM_{2.5} infrequently exceed health standards in the portion of Contra Costa County west of the East Bay hills. The San Francisco Bay keeps air temperatures above freezing in winter and well below 100 degrees on even the warmest summer days.

In eastern Contra Costa County, summer afternoon temperatures frequently approach triple digits, spurring ozone levels to exceed health standards. In winter, PM_{2.5} can be transported

westward through the Carquinez Strait from the Central Valley where it adds to wood smoke, causing health standards to be exceeded.

3.3.2 Discussion

The 2017 BAAQMD CEQA Guidelines present four thresholds of significance for construction-related criteria air pollutant and precursor emissions, which are summarized in Table 3-1. If daily average emissions of construction related criteria air pollutants or precursors would exceed any of these applicable thresholds of significance, the project would result in a significant cumulative impact.

Table 3-1 Thresholds of significance for Criteria Pollutants.

Pollutant/Precursor	Thresholds of Significance
Reactive Organic Gas (ROG)	54 lbs/day
Nitrous Oxide (NO _x)	54 lbs/day
Particulate Matter (PM ₁₀)	82 lbs/day (exhaust emissions only)
Particulate Matter (PM _{2.5})	54 lbs/day (exhaust emissions only)

The major emissions from this project would include:

- Fugitive dust (PM₁₀ and PM_{2.5})
- Combustion emissions of criteria air pollutants (ROG, NO_x, PM_{2.5}, and PM₁₀) primarily from operation of loaders, excavators, boats, and tugboats for transportation of equipment, workers, earth, and manmade materials.

Table 3-2 below shows the criteria air pollutant and precursor emissions calculated from the Road Construction Emissions Model Version 8.1.0 described in Appendix B. Appendix B describes the model in detail, explaining the assumptions and rationale of the calculations.

Table 3-2. Average Daily Air Pollutant Emissions (8-hour work day, 22 work days a month)

Pollutant/Precursor	Thresholds of Significance	Daily Emission Estimates	Exceeds Threshold?
ROG	54 lbs/day	1.28 lbs/day	No
NO _x	54 lbs/day	36.21 lbs/day	Yes
PM ₁₀	82 lbs/day (exhaust emissions only)	1.14 lbs/day (exhaust emissions only)	No
PM _{2.5}	54 lbs/day (exhaust emissions only)	2.79 lbs/day (exhaust emissions only)	No

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than significant impact

Work proposed in this Project, as analyzed in the Construction Emissions Model (Appendix B), would not conflict with implementation of the 2010 Clean Air Plan. Daily emission estimates for ROG, NO_x, PM_{2.5}, and PM₁₀ would all be below the Thresholds of Significance established in the BAAQMD 2017 CEQA Guidelines (Table 3-2). Impacts would be less than significant.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less than significant impact

BAAQMD is in attainment for Nitrogen Dioxide for California standards. The United States Environmental Protection Agency was set to designate if BAAQMD has attained the federal standard at the end of 2017, which has since elapsed and no determination has been made yet. While it is determined that the NO_x is estimated to be a cumulatively significant impact, it does not violate any air quality standard nor does it contribute to a current air quality violation or a criteria air pollutant/precursor in non-attainment status.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

Less than significant impact

The Project would be in compliance with ROG, NO_x, PM_{2.5}, and PM₁₀ standards and would not contribute to cumulatively considerable net increase in any criteria pollutant. Impacts would be less than significant.

d) Expose sensitive receptors to substantial pollutant concentrations?

No impact

The nearest sensitive receptors are schools located in Pittsburg more than two miles southwest of the Island. Winds would disperse the already relatively minor concentrations of pollutants to negligible amounts before reaching Pittsburg. There would be no impact.

e) Create objectionable odors affecting a substantial number of people?

Less than significant impact

The nearest notable location is a Dow chemical plant and USS-Posco steel fabrication plant less than 1 mile across New York Slough. It is unlikely that workers would be affected by diesel exhaust fumes because strong winds would be necessary to blow diesel fumes towards the shore. Impacts would be less than significant.

3.4 Biological Resources

Environmental Factors and Focused Questions for the Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?			X	
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

3.4.1 Environmental Setting

Habitat Types

The Project area contains four primary vegetation types (Table 3-3; Figure 3-1), with the majority being Arid West Freshwater Emergent Marsh. See below for a description of each community.

Table 3-3. Vegetation types present on Winter Island.

Vegetation Type		Area (acres)	Percent Total Survey Area
Arid West Freshwater Emergent Marsh		404.6	74.3%
California Annual Forb/Grass Vegetation		18.3	3.4%
Freshwater Aquatic Vegetation		8.8	1.6%
Nonnative Trees		1.8	0.3%
<i>Unvegetated Areas</i>			
Open Water	Tidal Perennial Aquatic	62.5	11.5%
	Muted Tidal Perennial Aquatic	48.4	8.9%
Total		544.4	100%

Arid West Freshwater Emergent Marsh

Arid West Freshwater Emergent Marsh occurs on almost 75 percent of the Project area and consists of cattails (*Typha angustifolia* and *T. latifolia*), tules (*Schoenoplectus acutus* var. *occidentalis* and *S. californicus*), common reed (*Phragmites australis*), and primrose-willow (*Ludwigia* sp.; Figure 3-4). The perimeter and northern areas of Winter Island are more densely populated with common reed, while the interior and southern portions contain a higher proportion of native cattails and tules. This type of habitat is beneficial to species such as river otter (*Lontra canadensis*), American bittern (*Botaurus lentiginosus*), beaver (*Castor canadensis*), and fish species like Largemouth Bass (*Micropterus salmoides*), Tule Perch (*Hysterocarpus traskii*), and Chinook Salmon when accessible.

California Annual Forb/Grass Vegetation

California Annual Forb/Grass Vegetation is found on the perimeter levee and on the disturbed upland area on a southwestern portion of Winter Island (Figure 3-3). The levee system is relatively narrow (30 feet), but more so on the eastern side (10 feet). Both the east and west sides of the island experience direct wave forces; however, the eastern levee receives additional impacts from eastern winds, spring storms, and water outflow. The levee is dominated by nonnative herbaceous species including ripgut brome (*Bromus diandrus*), Italian thistle (*Carduus pycnocephalus* subsp. *pycnocephalus*), Bermuda grass (*Cynodon dactylon*), Italian rye grass (*Festuca perennis*), fennel (*Foeniculum vulgare*), mouse barley (*Hordeum murinum*), broadleaved pepperweed (*Lepidium latifolium*), and cultivated radish (*Raphanus sativus*). Small patches of pickleweed (*Salicornia pacifica*) occur in shallow indentations in the levee along the northwestern side of the island and at the northern water control structure.



Figure 3-1. Vegetation types present on Winter Island



Figure 3-2. Typical emergent marsh habitat inside of Winter Island



Figure 3-3. Typical upland levee habitat on the western side of Winter Island

Freshwater Aquatic Vegetation

Pockets of Freshwater Aquatic Vegetation occur within the interior channel of the main island (Figure 3-4), which primarily consist of floating primrose-willow and some water hyacinth (*Eichhornia crassipes*).



Figure 3-4. Photo taken at the northern water control structure, looking south. *Ludwigia* can be seen at the edges of the emergent marsh habitat.

Nonnative Trees

Nonnative Trees surround the developed area and private property on the southern end of Winter Island and occur in small pockets along the levees. Mapped nonnative trees include blackwood acacia (*Acacia melanoxylon*), tree-of-heaven (*Ailanthus altissima*), smallflower tamarisk (*Tamarix parviflora*), tobacco tree (*Nicotiana glauca*), and Mexican fan palm (*Washingtonia robusta*). The nonnative trees provide low quality habitat to birds and other terrestrial animals.

Tidal Perennial Aquatic

Tidal perennial aquatic habitat is present in the sloughs surrounding Winter Island. While the culverts at the northern and southern ends of the island are closed, the only hydrologic access to the site is through an existing 150-foot breach in the eastern levee that occurred in 2004. A channel that runs north from that breach is the only tidal perennial aquatic habitat that exists within the island. Limited channel connectivity and thick emergent vegetation lead to the muted tidal status for the rest of the island. Fish species such as Tule Perch, Bluegill (*Lepomis macrochirus*), and Threespine Stickleback (*Gasterosteus aculeatus*) are known to occur in this habitat (CDFW unpublished data).



Figure 3-5. The existing breach and interior tidal channel (left) which constitutes the only fully tidal habitat on Winter Island.



Figure 3-6. An example of muted tidal habitat on Winter Island, located at the southern end of the central channel. The habitat was actively cleared of vegetation prior to DWR acquisition.

Muted Tidal Perennial Aquatic

The central channel and open water duck ponds on the interior of the island are considered muted tidal perennial aquatic habitat. Limited access and thick emergent vegetation inhibits water on and off the site, resulting in muted high and low tides. The channel and duck ponds were actively maintained by the duck club, but management ceased upon acquisition by DWR. Without active vegetation control, the duck ponds are expected to fill in with emergent marsh vegetation. This habitat is beneficial to birds, otters, and beavers.

Special Status Plants

Special-status and invasive plant surveys were conducted by Stillwater Sciences in June 2016; surveys for rare plants were focused where construction would potentially occur (Figure 3-7, Figure 3-8, and Figure 3-9). Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), and Suisun Marsh aster (*Symphyotrichum lentum*) were found on the exterior levees; however, Delta tule pea was particularly dense on the western levee, and consequently, Project Alternatives that included a western breach were abandoned. While areas outside the potential construction locations were not surveyed, wooly rose-mallow (*Hibiscus lasiocarpus*) was sighted on the southeastern levee.

The likelihood of special-status species presence on Winter Island was determined by the documented observations of a species on site, the presence and quality of potential habitat, and the proximity of known occurrences off site. This resulted in the following categories of likelihood for a special-status species to occur under current conditions:

- None: the species' required habitat (i.e., the plant community types and/or elevation range) is lacking from the Project area.
- Low: the species' required habitat either does not occur in the Project area or is of very low quality such that no observations have occurred on or near the Project area.
- Moderate: the species' required habitat occurs on site and there are known populations nearby, but there are no recorded observations on site.
- High: the species has been documented on site.

A discussion of special status plants with potential to occur in the Project area can be found in Table 3-4.



Figure 3-7. Survey locations for the June 2016 rare and invasive species survey.



Figure 3-8. Special-status plant observations at the northern breach location.



Figure 3-9. Special-status plant observations at the southern breach location.

Table 3-4. Special-status plants with potential to occur on Winter Island.

Common Name (Scientific Name)	Status ¹ Federal/State/CRPR	Habitat Requirements	Likelihood to occur on site under existing conditions	Likelihood to occur on site under post- restoration conditions
Bolander's water-hemlock <i>Cicuta maculata</i> var. <i>bolanderi</i>	–/–/2B.1	Coastal, brackish, and freshwater marshes and swamps; blooms July through September	High: occurrences have been documented on surrounding islands	High: suitable habitat would remain on site
Delta mudwort <i>Limosella australis</i>	–/–/2B.1	Mud banks of freshwater and brackish marshes and swamps, and riparian scrub; blooms May to August	High: occurrences have been documented on surrounding islands	High: suitable habitat would remain on site
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	–/–/1B.2	Freshwater and brackish marshes and riparian habitats; blooms May to July	High: occurs on site	High: suitable habitat would remain on site
Eel-grass pondweed <i>Potamogeton</i> <i>zosteriformis</i>	–/–/2B.2	Freshwater marshes and wetland- riparian habitats; blooms June to July	Moderate: suitable habitat is on site, but no occurrences nearby	Moderate: suitable habitat would remain on site
Mason's lilaeopsis <i>Lilaeopsis masonii</i>	–/SR/1B.1	Freshwater and brackish marshes and swamps; usually restricted to area of tidal influence; blooms April to November	High: occurs on site	High: suitable habitat would remain on site
Northern California black walnut <i>Juglans hindsii</i>	–/–/1B.1	Riparian forest and riparian woodlands; blooms April through May	Low: suitable habitat is limited on site	Low: Project would not create any more suitable habitat
Pappose tarplant <i>Centromadia parryi</i> subsp. <i>Parryi</i>	–/–/1B.2	Alkaline, vernal mesic, seeps, valley vernal pools, and roadsides; blooms May through November	None: no suitable habitat on site	None: Suitable habitat would not be created
Saline clover <i>Trifolium hydrophilum</i>	–/–/1B.2	Marshes, swamps, mesic, or alkaline grassland and vernal pools; blooms April through June	Low: suitable habitat is limited on site	Low: Project would not create any more suitable habitat

Sanford's arrowhead (<i>Sagittaria sanfordii</i>)	–/–/1B.2	Shallow freshwater marshes and swamps; blooms May through October	Low: suitable habitat would be seasonal, no nearby occurrences	Low: Project would not create any more suitable habitat
Soft bird's-beak (<i>Chloropyron molle</i> subsp. <i>Molle</i>)	FE/SR/1B.2	Coastal salt marshes and swamps; found in wetland-upland transition area and edges of salt pans; blooms July to November	Low: suitable habitat is limited on site; salinity may be too low; no local seed source	Low: Project would not create any more suitable habitat
Suisun Marsh aster (<i>Symphyotrichum lentum</i>)	–/–/1B.2	Freshwater marshes and wetland-riparian habitats; usually restricted to areas of tidal influence; blooms May to November	High: occurs on site	High: suitable habitat would remain on site
Suisun thistle (<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>)	FE/–/1B.1	Salt marshes and swamps; restricted to upper reaches of tidal marshes blooms June through September	Low: suitable habitat is limited on site	Low: Project would not create any more suitable habitat
Wooly rose-mallow (<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>)	–/–/1B.2	Freshwater marshes and riparian habitats; blooms June to September	High: occurs on site	High: suitable habitat would remain on site

1. Status:

Federal

FE Federally listed as endangered

– No federal status

State

SR State listed as rare

– No state status

California Rare Plant Rank (CRPR)

1B Plants rare, threatened, or endangered in California and elsewhere

2B Plants rare, threatened, or endangered in California, but more common elsewhere

CRPR Threat Ranks:

0.1 Seriously threatened in California (high degree/immediacy of threat)

0.2 Fairly threatened in California (moderate degree/immediacy of threat)

Special Status Fish

The list of special-status fish considered during impact analysis for this Project was compiled using a California Natural Diversity Database (CNDDDB; CDFW (b) 2017) search within a 5-mile radius of Winter Island (Appendix C), CDFW fish databases (CDFW (a) 2017), USFWS Information for Planning and Conservation species generator website (Appendix D), and through informal communication with CDFW (Dave Contreras, personal communication, November 3, 2017; Table 3-6). A brief summary of each special-status fish species, including status, life history, and habitat requirements, are provided in the sections below.

The likelihood of presence was determined by the quality of habitat found at the site, and the known occurrences at or near the site. This resulted in the following categories of likelihood for a special-status fish to occur in the Project area:

- None: The species' required habitat is not present on site and no observations of the species have been documented nearby.
- Low: The species' required habitat either does not occur, may occur in low quality, or may occur with little accessibility. No observations have been made on site but the Project area may still be within the species range.
- Moderate: The species' required habitat does occur on site and may occur nearby, but species has not been documented on site.
- High: The species' required habitat does occur on site and the species has been observed in the Project area.

Table 3-5. Special-status fish species with potential to occur on Winter Island.

Common Name (Scientific Name)	¹ Status Federal/State	Habitat Requirements	Likelihood to occur on site under current conditions	Likelihood to occur on site under post- restoration conditions
Pacific Lamprey (<i>Entosphenus tridentatus</i>)	FSC/SSC	Coastal streams and upper reaches of San Francisco Estuary and tributaries; spawn in gravelly streams in spring and rear in silty backwater. Adults enter the Estuary as early as January but presence peaks in spring; anadromous	Low: backwater suitable for rearing likely on site, though access is limited	Moderate: access to suitable habitat would increase
River Lamprey (<i>Lampetra ayresi</i>)	-/SSC	Coastal streams and upper reaches of the Estuary and tributaries; spawn in streams in spring and rear in silty backwater; adults may migrate briefly to ocean before returning in fall; anadromous	Low: backwater suitable for rearing likely on site, though access is limited	Moderate: access to suitable habitat would increase
Green Sturgeon, southern distinct population segment (<i>Acipenser medirostris</i>)	FT/SSC	Large, main stem rivers with cool water and cobble, clean sand, or bedrock for spawning; juveniles found year-round throughout the Delta, preferring benthic habitat	Low: adult and juvenile sturgeon may occur nearby, but access within site is limited	Moderate: access to suitable habitat would increase
White Sturgeon (<i>Acipenser transmontanus</i>)	-/SSC	In estuaries, adults tend to concentrate in deep areas with soft bottoms, although they may move into intertidal areas to feed at high tides	Low: adult and juvenile sturgeon may occur nearby, but access within site is limited	Moderate: access to suitable habitat would increase
Sacramento Hitch (<i>Lavinia exilicauda</i>)	-/SSC	Warm, lowland, waters including turbid sloughs; spawning occurs over gravel riffles or on vegetation; tolerant of high temperatures and low salinities	Low: within known range; desirable habitat on site, though access is limited	Moderate: access to suitable habitat would increase, but presence in delta is low

Sacramento Splittail (<i>Pogonichthys macrolepidotus</i>)	-/SSC	Slow-moving sections of rivers and sloughs in Delta and Suisun Marsh; tolerate a range of salinities, low dissolved oxygen levels, and temperatures; preferred spawning habitat over vegetation in floodplains in late winter through spring	Moderate: within known range of species; desirable habitat on site, though access is limited	High: access to suitable habitat would increase
Delta Smelt (<i>Hypomesus transpacificus</i>)	FT/SE	Tidal areas from freshwater up to salinities of 18 parts per thousand (ppt); primarily near and upstream of the brackish zone where bottom salinity is approximately 2 ppt; spawning occurs in tidal areas, most commonly upstream of salinity at 2 ppt; high turbidity levels (e.g. >10 nephelometric turbidity units) and moderate temperatures (<25°C) required for all life stages	Moderate: within known range and critical habitat of species; project area within the low salinity zone, which is correlated to species occurrence, but access to island is limited	High: access to suitable habitat would increase
Longfin Smelt (<i>Spirinchus thaleichthys</i>)	-/ST	Tolerant of a wide range of salinities, pelagic and anadromous species found in scattered bays and estuaries from CA to Alaska.	Moderate: within known species range, but access to site is limited	High: access to suitable habitat would increase
Chinook Salmon (spring-run) (<i>Oncorhynchus tshawytscha</i>)	FT/SE	Low- to mid-elevation rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean	High: 1 juvenile (presumably spring-run) caught within Project area; within known range of species; desirable habitat on site, though access is limited	High: access to suitable rearing habitat would increase
Chinook Salmon (fall-run and late-fall-run) (<i>Oncorhynchus tshawytscha</i>)	SC/SSC	Main stem river reaches with cool water and available spawning; typically rear in freshwater for less than one year before migrating to the ocean	High: within known range of species; desirable habitat on site, though access is limited	High: access to suitable rearing habitat would increase
Chinook Salmon (winter-run) (<i>Oncorhynchus tshawytscha</i>)	FE/SE	Sacramento River and tributaries below Shasta Dam with cold water, and clean gravel appropriate for spawning; peak juvenile migration through the Delta occurs January through March	High: within known range of species; desirable habitat on site, though access is limited	High: access to suitable rearing habitat would increase

Central Valley Steelhead (<i>Oncorhynchus mykiss</i>)	FT/-	Enter freshwater beginning in August with peaks in September and October; hold in cool pools until flows allow for upstream migration; spawn in gravelly streams.	Moderate: within known range of species; desirable habitat on site, though access is limited.	High: access to suitable rearing habitat would increase
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1. Status

Federal

FE Federally Endangered

FT Federally Threatened

FSC Federal Species of Concern

– No federal status

State

SE State Endangered

ST State Threatened

SSC State Species of Special Concern

–No state status

Pacific Lamprey

Pacific Lamprey (*Entosphenus tridentatus*) are an anadromous, parasitic species that occur throughout the San Francisco Estuary (Estuary), as well as other estuaries along the Pacific Ocean. As the largest lamprey in California, adults can be greater than 40 cm tail length (TL), however, some landlocked populations that occur upstream of dammed reservoirs have dwarf morphs (15-30 cm TL). Adults spend the majority of their life in the ocean feeding upon the bodily fluids of fish and marine mammals. Adults are capable of migrating large distances without feeding for extended periods (several months to two years). Migration into freshwater reaches usually occurs from late winter to late spring and spawning occurs over gravelly substrate. Ammocoetes rear in freshwater, feeding upon algae, detritus, and other microorganisms for up to seven years until undergoing physiological metamorphosis, characterized by the development of large eyes, sucking mouthparts, and a tolerance to salinity. Downstream migration occurs upon the completion of metamorphosis and is often associated with winter and spring high flow events (Moyle et al. 2015; Goodman et al. 2015).

Pacific Lamprey abundance has declined throughout their range, however, the extent of their decline is largely unknown within the Estuary. CDFW's Bay Study occasionally collects juveniles (<30 cm TL) in open water at stations near Winter Island, primarily during winter months. From 1980 to 2014, a total of 50 individuals were observed in otter trawl tows (CDFW (a) 2017). Upon Project completion, Winter Island could provide some backwater rearing habitat for juveniles. Pacific Lampreys are considered a federal and state Species of Special Concern (Moyle et al. 2015).

River Lamprey

River Lamprey (*Lampetra ayresii*) occur in estuaries and the lower reaches of large rivers along the Pacific coast, but little is known about their abundance and life history in California. Their habitat requirements are assumed to be similar to that of other lampreys; adults requiring freshwater, gravelly streams for spawning and ammocoetes needing sandy-silty substrate for rearing. Adults are small (≤ 18 cm TL) and feed upon the muscle tissue of fish, including herring and salmon. Adult migration into freshwater likely begins in the fall, with spawning occurring during the winter and fall months. Ammocoetes likely rear in freshwater for 3 to 5 years before complete metamorphosis occurs. Adults spend only 3-4 months in the ocean before returning to freshwater to spawn.

Little is known about River Lamprey abundance in California, but populations have likely declined due to factors such as loss of habitat and water diversion (Moyle et al. 2015). A review of CDFW Bay Study's fish database indicates 45 River Lampreys were caught by otter trawl at stations near Winter Island, between 1980 and 2014 (CDFW (a) 2017). Winter Island could provide adequate rearing habitat once access to internal portion of the island is improved. River Lampreys are a California Species of Special Concern (Moyle et al. 2015).

Green Sturgeon

Green Sturgeon (*Acipenser medirostris*) are large, anadromous fishes that occur in coastal waters and freshwater estuaries from Alaska to Mexico. Two distinct populations are recognized

under the Federal Endangered Species Act: the northern Distinct Population Segment (DPS) and the southern DPS. Though adults from both populations likely interact in the ocean (Moyle et al. 2015), only the southern DPS is known to spawn and rear within the Estuary (Seesholtz et al. 2015).

Green Sturgeon reach sexually maturity at the age of 15, or a total length of 150-155 cm, and spawn every 2 to 6 years. Adults enter the Estuary from late winter through early spring and spawn from April through early July (NMFS 2015). Spawning primarily occurs within the upper reaches of the Sacramento River, but has also been observed in the Feather River, and may occur in the Yuba River (Heublein et al. 2017; Poytress et al. 2015). Adults spawn in cool, deep pools containing gravel, cobble, or boulder substrate (NMFS 2015). Larvae likely rear near spawning habitat for a few months before entering the Estuary as juveniles, but their distribution may be influenced by spring and summer outflow, and may extend downstream during years of high flow. Juveniles may enter the ocean and transition to subadults in as little as one year; however, the duration of rearing in the Delta and habitat preferences of juveniles remains relatively unknown (Heublein et al. 2017; NMFS 2015). Subadults are migratory and forage within the coastal ocean, as well as estuarine waters during the summer (Israel and Kimley 2008). Both adult and juvenile Green Sturgeons are benthic feeders, consuming shrimp, amphipods, clams, other invertebrates, and small fish (Moyle 2002).

Monitoring efforts in the Delta do not target juvenile Green Sturgeon, thus observations are rare (Heublein et al. 2017). At sampling stations near Winter Island, 10 Green Sturgeon were caught by CDFW Bay Study's otter trawl net from 1980-2014. All of the individuals collected were juveniles, with fork lengths (FL) ranging from 24.3 cm to 69.3 cm (CDFW (a) 2017).

The southern DPS was listed in 2006 as threatened pursuant to the federal Endangered Species Act (71 Federal Register [FR] 17757). Critical habitat for the Southern DPS was designated in 2009 and includes all waters of the legal Delta (74 FR 52300). Green Sturgeon are also considered a California Species of Special Concern with a High Concern status (Moyle et al. 2015).

White Sturgeon

White Sturgeon (*A. transmontanus*) are the more common and abundant sturgeon species in California. Though their range extends from the Gulf of Alaska to Mexico, only one genetically distinct population spawns in the Estuary, primarily within the Sacramento and San Joaquin rivers. Unlike Green Sturgeon, adult White Sturgeon spend the majority of their lives in brackish, estuarine waters, but are known make long ocean migrations along the west coast to forage in other estuaries (Moyle et al. 2015; Schreier et al. 2013).

Male White Sturgeon reach sexual maturity at 10-12 years old, while females mature at 12-16 years old, and spawn every 3-5 years thereafter (Moyle et al. 2015). Upstream migrations to freshwater spawning habitat usually begins in fall and early winter, with spawning occurring between mid-February and early June. Spawning habitat can vary from having swift to slow currents and substrates ranging from silt and sand to gravel and cobble. Larvae rear in benthic

habitats until dispersing downstream in the spring as juveniles. Small juveniles primarily occupy less saline portions of estuaries, as their ability to osmoregulate increases with size (Heublein et al. 2017). The diet of juveniles and adults is dominated by benthic invertebrates, but becomes more varied as they grow. Adults will also consume overbite clam (*Corbula amurensis*) and fish, including herring, striped bass, and anchovy (Moyle et al. 2015).

White Sturgeon may be present year-round in the waters surrounding Winter Island. From 1980-2014, 224 juvenile and adult White Sturgeon were caught at CDFW Bay Study Stations 535 and 736, in close proximity to Winter Island (CDFW (a) 2017). During CDFW's Juvenile Sturgeon Setline Survey conducted from 1991-2002, a total of 443 White Sturgeon were collected from Broad Slough, the Sacramento River (near Sherman Island), and around Chain Island (DuBois et al. 2010).

White Sturgeon is a California Species of Special Concern with a designated High Concern status. Although White Sturgeon are successfully cultured, annual recruitment in California appears to have decreased since the early 1980s (Moyle et al. 2015).

Sacramento Hitch

Sacramento Hitch (*Lavinia exilicauda*) are a native cyprinid species closely related to California Roach (*Hesperoleucus symmetricus*). The Sacramento subspecies occurs within warm lowland streams and sloughs within the Estuary and in a few outlying lakes and reservoirs, though they are considered extirpated from the San Joaquin River. In the Delta, hitch are most likely found in association with aquatic vegetation for spawning and protection. They have high temperature tolerances (15-26°C) and can endure salinities of up to 9 ppt. Adults mature in 1-3 years and spawn in riffles of vegetation in response to spring flows. Juveniles rear in shallow water, near aquatic plants that provide cover, or on floodplains when available. After reaching approximately 50-millimeter (mm) FL, juveniles move into open water. Sacramento Hitch have pharyngeal teeth adapted for grinding food and feed upon zooplankton, insects, and filamentous algae (Moyle et al. 2015).

Within the Delta, fish sampling programs and studies have caught relatively few Hitch over the years. However, during a series of sampling events inside of Prospect Island, Hitch were found in high abundance (70+ individuals) during one sampling event (CDFW unpublished data). Sacramento Hitch is a California Species of Special Concern with a designated Moderate Concern Status (Moyle et al. 2015).

Sacramento Splittail

Sacramento Splittail (*Pogonichthys macrolepidotus*) are endemic to the San Francisco Estuary and are the only surviving member of its genus (Sommer (a) et al. 2007; Baerwald et al. 2006). Though Splittail have a high level of genetic diversity, at least two genetically distinct populations exist: the Petaluma and Napa Rivers population and the Cosumnes, Sacramento, and San Joaquin Rivers population. Differentiation may be due to dissimilar foraging and rearing habitats, salinity tolerances, and spawning times or localities (Baerwald et al. 2006).

Splittail forage in brackish habitats and reach maturity at 1-2 years. Adults migrate into freshwater from November through February in response to flow events and subsequently spawn on floodplains or river edges; however, individuals from the Petaluma/Napa River population can spawn and rear in brackish water. Larvae seek cover in vegetation and leave spawning grounds as flood waters recede. Splittail are benthic foragers, feeding on detritus and invertebrates, including overbite clam (Moyle et al. 2015).

CDFW long term fish monitoring programs indicate Splittail are occasionally present near Winter Island, primarily during spring months. Splittail are collected year-round by the USFWS Juvenile Fish Monitoring Program at their Chipps Island stations downstream from the Project area (CDFW (a) 2017; USFWS 2017). Splittail were listed by USFWS as a threatened species in 1999 due to concerns about long-term abundance declines, but re-analysis of abundance data led Splittail to be de-listed in 2003. CDFW considers Splittail to be a Species of Special Concern with Moderate Concern status (Moyle et al. 2015).

Delta Smelt

Delta Smelt (*Hypomesus transpacificus*) are a small-bodied fish endemic to the upper Estuary. Their range extends from the Suisun and San Pablo Bays up into the freshwater reaches of the Sacramento and San Joaquin Rivers. Individuals spend the majority of their yearlong life cycle in salinities less than 6 practical salinity units, in an area known as the low-salinity zone; however, fish can also occur in freshwater and areas with higher salinity (Sommer and Mejia 2013). A non-migratory contingent of the wild population carries out their entire lifecycle in the tidal freshwater region of the Cache Slough Complex, which offers cool, turbid habitat and abundant prey (Sommer et al. 2011).

Delta Smelt primarily occupy open water, away from the bottom and shore associated structural features, but they have been shown to enter shallow waters to avoid peak ebb tides, an activity dubbed “tidal surfing” (Nobriga and Herbold 2009; Bennett and Burau 2015). They are strongly associated with turbid water, which may aid in predator avoidance and feeding success (Sommer and Mejia 2013). They feed upon a variety of aquatic invertebrates, including zooplankton, mysid shrimp, and amphipods. The spawning behavior of Delta Smelt is relatively unknown, though research suggests individuals are capable of spawning multiple times in one spawning season given the appropriate environmental conditions (Lindberg et al. 2013; Damon et al. 2016). Wild spawning has not been observed, but captive breeding programs have observed Delta Smelt spawning on the bottom and sides of tanks, indicating they need substrate (LaCava et al. 2015). Spawning migration upstream to tidal freshwater is triggered by the first flow pulses of the year, typically from December through March (Grimaldo et al. 2009; Sommer et al. 2011). After hatching, young smelt may return downstream and rear in brackish regions of the Estuary (Dege and Brown 2004).

As with other pelagic fish found within the Estuary, Delta Smelt have experienced a substantial population decline in recent decades (Sommer (b) et al. 2007, Baxter et al. 2010). Delta Smelt abundance indices calculated from the CDFW Summer Townet and Fall Midwater Trawl surveys suggest Delta Smelt abundance is still relatively low compared to previous decades

(www.dfg.ca.gov/delta/data). The 2016 and 2017 Fall Midwater Trawl indices of 8 and 2, respectively, are the lowest on record.

At sampling stations near Winter Island, long-term fish monitoring programs indicate Delta Smelt are present year-round in open water (Table 3-6; CDFW (a) 2017). Similarly, Delta Smelt are caught regularly by the USFWS Delta Juvenile Fish Monitoring Program at their Chipps Island sampling station downstream from the Project area (1976-2017; USFWS 2017).

Table 3-6. Delta Smelt raw catch totals, by month, from CDFW long-term monitoring program sampling stations near Winter Island (CDFW (a) 2017).

	SMWT¹	SKT²	20mm³	STN⁴	FMWT⁵	BSMWT⁶	BSOT⁷
January (Adult)	26	91				15	1
February (Adult)	5	45				18	0
March (Adult/Larval)	6	36	17			14	3
April (Adult/Larval)	0	35	246			16	1
May (Adult/Larval/Juvenile)		18	1191			1	0
June (Adult/Larval/Juvenile)			1728	188		17	4
July (Adult/Juvenile)			184	484		30	11
August (Adult/Juvenile)				181		37	10
September (Adult)					244	112	23
October (Adult)					202	40	3
November (Adult)					178	57	5
December (Adult)		1			112	41	1

1. Spring Midwater Trawl (SMWT) sampling stations 802, 701, 513, 512, 511, 510 from 1995-2001.

2. Spring Kodiak Trawl (SKT) sampling stations 513, 520, 801 from 2002-2017

3. 20mm sampling stations 801, 804, 703 from 1995-2016.

4. Summer Trawl (STN) sampling stations 513, 520, 801 from 1995-2017.

5. Fall Midwater Trawl (FMWT) sampling stations 802, 701, 513, 512, 511, 510 from 1995-2017.

6. San Francisco Bay Study Midwater Trawl (BSMWT) sampling stations 535 and 736 from 1995-2014.

7. San Francisco Bay Study Otter Trawl (BSOT) sampling stations 535 and 736 from 1995-2014.

The USFWS listed Delta Smelt as threatened on March 5, 1993 (58 FR 12854), and designated critical habitat for the species on December 19, 1994 (59 FR 65256). On April 7, 2010, USFWS announced their 12-month finding on a petition to reclassify the Delta Smelt from a threatened to an endangered species. They determined that reclassification is warranted, but precluded by other higher priority listing actions (75 FR 17667). The Delta Smelt was also listed in 1993 as a

threatened species pursuant to the California Endangered Species Act and changed to endangered on January 20, 2010.

Longfin Smelt

Longfin Smelt (*Spirinchus thaleichthys*) are a pelagic species that occur in estuaries along the Pacific Coast, with the San Francisco Estuary being the southernmost location within the species' range. Individuals from this Estuary's population are genetically isolated from other populations and live out their entire life cycle within the Estuary and adjacent coastal waters (Merz et al. 2013; Rosenfield and Baxter 2007). The distribution of Longfin Smelt depends on salinity and water temperature, as well as on the life stage of individual fish (Moyle 2002). Adults are typically found in salinities of 14-28 ppt and may be restricted by water temperatures greater than 22 degrees (77 FR 19756). Adults spawn at two years of age in tidally influenced freshwater habitats during winter. Little is known about Longfin Smelt spawning habitat; however, recent studies suggest adults use tidal sloughs and open water shoals (Grimaldo et al. 2017). Larvae may rear at spawning grounds or downstream depending on levels of freshwater outflow. Juveniles and adults are present throughout the Estuary year-round (77 FR 19756; Rosenfield 2010). Longfin Smelt primarily feed upon zooplankton, mysids, and amphipods (77 FR 19756).

Longfin Smelt are known to occur within open water and littoral habitats near the Winter Island. Long term monitoring programs once caught individuals of all life stages year-round; however, numbers have declined in recent years (CDFW (a) 2017). During sampling conducted by ICF in 2013 and 2014, 11,562 larvae were collected from sampled littoral habitats, including the inner sloughs of Browns Island and the shoals of Sherman Island (Grimaldo et al. 2017). Similarly, CDFW 20mm caught 4,281 larvae in nearby open water during the same years. CDFW Bay Study will occasionally catch both juveniles and adults during midwater trawling near Winter Island.

In 2012, the USFWS determined that federal listing of the San Francisco Bay-Delta DPS was warranted, but precluded by other higher priority listing actions (77 FR 19756). The Longfin Smelt was State listed as threatened by CDFW in 2009 because of its declining abundance in the Delta.

Chinook Salmon

Chinook Salmon (*Oncorhynchus tshawytscha*) are the only abundant salmon species found within the Estuary; however, populations have been declining dramatically since the mid-1800s (NMFS 2014). Four runs with different life history characteristics inhabit the Estuary: Sacramento River winter-run Chinook Salmon, Central Valley spring-run Chinook Salmon, Central Valley fall-run Chinook Salmon, and Central Valley late fall-run Chinook Salmon. Though genetically distinct, the four runs are more closely related to each other than to populations found outside of the Estuary. Runs are primarily differentiated by the timing of their spawning migration and movement between habitat types throughout their life cycle (Moyle et al. 2015). For management purposes, juveniles are identified by size criteria that reflect the life history characteristics of the various runs.

As an anadromous species, Chinook Salmon occupy the lower Delta as adults during their upward migration to freshwater spawning grounds. As juveniles, their rearing time in the area may vary. Fry seek refuge along banks with vegetated cover, swirling water, and dark backgrounds, eventually moving into deeper waters as they grow to avoid avian predators. Juveniles move downstream at night, finding protection in cool pools during the day (Moyle et al. 2015). Juveniles may forage on floodplains before entering the Estuary and grow at a faster rate than individuals rearing in river channels. Juvenile diet is diverse and can vary between zooplankton, amphipods, mysids, and aquatic insects (Sommer et al. 2001, David et al. 2014).

Chinook Salmon may be present year-round in waters surrounding Winter Island. CDFW Spring Kodiak Trawl and the Bay Study midwater trawl primarily catch salmon April through May (CDFW (a) 2017). Similarly, The USFWS Delta Juvenile Fish Monitoring Program regularly collect salmon near Chipps Island, downstream of the Project area, with catch being greatest from April through June. The Program also collects salmon at beach seining sites near Winter Island from December through June (Table 3-7). In April 2017, one juvenile unclipped Chinook Salmon (92 mm FL), was caught in a fyke trap deployed by the Fish Restoration Project Monitoring Program at the mouth of a small channel located on the eastern side of Winter Island (CDFW unpublished data).

Table 3-7. Chinook Salmon raw catch totals, by month and race, from USFWS beach seine stations near Winter Island. Antioch Dunes (stations SJ001S) was sampled 1979-2017 and Sherman Island was sampled 1976-2017.

Antioch Dunes						
	Fall	Late-fall	Spring	Winter	Ad Clip	Total
January	113	1	3	2	-	119
February	479	-	11	1	1	492
March	429	-	15	-	1	445
April	164	1	17	-	26	208
May	99	-	17	-	23	139
June	1	-	-	-	-	1
December	5	-	1	-	-	6

Sherman Island						
	Fall	Late-fall	Spring	Winter	Ad Clip	Total
January	1163	1	163	8	-	1335
February	2256	1	116	3	10	2386
March	2169	-	33	1	17	2220
April	659	10	10	-	6	685
May	54	5	2	-	3	64
June	7	-	-	-	-	7
December	100	-	11	6	-	117

Notes: Race determined by length; No salmon were collected during July-November sampling

Central Valley spring-run Chinook Salmon

Central Valley spring-run Chinook Salmon exhibit both “stream-type” and “ocean-type” life history strategies and are dependent upon year-round cool freshwater habitat (NMFS 2013). Spawning is restricted to higher elevation stream reaches, including Mill, Deer, and Butte creeks (Moyle et al. 2015; Good et al. 2005). Immature adults generally migrate to freshwater spawning grounds from March through July and spawn August to October after maturing over summer months. Fry emerge from November through March. Stream-type juveniles reside in freshwater for up to 10 months, while ocean-type out-migrate within their first year. Individuals generally spend 1-4 years in the ocean before returning to spawn (NMFS 2013).

Central Valley spring-run Chinook Salmon were once the second most abundant run in the Central Valley, but many factors have led to population declines in recent decades. Access to many historic spawning grounds no longer exists and adults are forced to spawn below dams, in habitats utilized by fall-run. Hybridization likely occurs between the two runs. Spring-run Chinook Salmon were listed as state and federally threatened in 1999 by the State Fish and Game Commission and NMFS (64 FR 50394). Critical habitat for Central Valley spring-run Chinook includes the Delta to the western edge of Sherman Island (70 FR 52488).

Central Valley fall-run Chinook Salmon

Central Valley fall-run adults are the largest of the Pacific salmonids and can exceed lengths of 140 centimeter (cm) standard length. They exhibit an “ocean-type” life history strategy and spawn in lower elevation stream reaches. Peak spawning occurs October through November, but may extend into January. Fry emerge in December through March and juveniles rear in freshwater for 1-7 months. Nocturnal downstream migration is initiated during periods of high flow, before stream temperatures exceed the thermal tolerances of juveniles. Survival during downstream migration is positively correlated with turbidity (Moyle et al. 2015). Fall-run juveniles are relatively young at ocean entry compared to juveniles of other runs and size at outmigration is likely important to survival. Individuals spend 2-3 years at sea before returning to migrating back to the Estuary.

Central Valley fall-run Chinook Salmon are the most abundant run in the Estuary and supported by hatchery production. However, due to loss of spawning habitat and low numbers of natural spawning individuals, fall-run are a federal and state Species of Special Concern (Moyle et al. 2015).

Central Valley late fall-run Chinook Salmon

Central Valley late fall-run Chinook Salmon migrate to freshwater generally from December-January as mature adults and spawn shortly after reaching spawning grounds. Fry emerge from April-June and may rear in freshwater for 7-13 months before outmigration. Historically, spawning likely occurred in the upper Sacramento and McCloud rivers prior to the construction of Shasta Dam, but now takes place within the Sacramento River between Red Bluff Diversion Dam (RBDD) and Redding.

Central Valley late fall-run were not considered a distinct population until 1966 after the construction of RBDD and are still classified within the Central Valley fall-run Evolutionarily Significant Unit (ESU) under the Federal Endangered Species Act. Due to loss of spawning habitat, dependence on Shasta Dam water management actions, and hatchery support, Central Valley late fall-run Chinook Salmon are a state Species of Special Concern (Moyle et. al 2015).

Sacramento River winter-run Chinook Salmon

Sacramento River winter-run exhibit a “stream-type” life history strategy, requiring cool water year-round and spawn in high elevation streams (Moyle et al. 2015). Spawning occurs within the Sacramento River, primarily between RBDD and Keswick Dam, but historically occurred in reaches above Shasta dam. Immature adults migrate into freshwater from January through April and spawn April to August after reaching maturity. Fry emerge June through October and rear in freshwater for 5-10 months before ocean entry (NFWS 2014).

In 1989, declines in the abundance of returning adults led the State Fish and Game Commission to list winter-run Chinook Salmon as endangered (CDFG 2005), while NMFS listed winter-run Chinook as a threatened species (54 FR 32085). In 1994, the federal listing status of winter-run Chinook Salmon was reclassified to endangered (59 FR 440). In 1993, critical habitat was designated for winter-run Chinook Salmon and includes the Sacramento River from Keswick Dam to Chipps Island at the western extent of the Delta (58 FR 33212).

Steelhead

Steelhead (*O. mykiss*) are an anadromous species native to the Estuary. Though they are not considered taxonomically distinct from the non-anadromous Rainbow Trout, Steelhead are generally larger, with second year spawning adults reaching 58.4 cm FL. Mature steelhead migrate into freshwater from August to April and spawn from December through April. Unlike salmon, Steelhead do not die after spawning and are capable of spawning multiple times during their lifespan. Spawning occurs below dams on every San Joaquin and Sacramento River tributary. Fry emerge from gravel beds four to six weeks after hatching. Juveniles typically spend 2 years in freshwater, rearing in cool, fast-flowing waters with cover provided by riparian trees or undercut banks. Peak juvenile migration through the Delta primarily occurs from March through April, but emigration typically occurs year-round. Juveniles will occasionally inhabit tidal marshes and other shallow water habitats prior to ocean entry. Immature adults reside in marine waters for 2-3 years prior to returning to freshwater spawning grounds (NMFS 2014).

Long-term fish monitoring programs rarely catch Steelhead near Winter Island. CDFW Spring Kodiak Trawl yearly collects a handful of individuals, primarily in February and March (CDFW (a) 2017). USFWS’s Juvenile Fish Monitoring Program catches Steelhead winter through spring during their Chipps Island trawl; however, most of the individuals collected since 2012 are hatchery raised, indicating that natural production of Steelhead has remained low (USFWS 2017).

The Central Valley Steelhead DPS was listed by NMFS as threatened in 1998 and the listing status was reaffirmed in 2006 because the resident and anadromous forms remain markedly

separated due to physical, ecological, and behavioral factors (71 FR 834). Critical Habitat for the species was designated in 2005 (70 FR 52488), and includes 254 square miles of estuarine habitat. CDFW considers the Central Valley Steelhead a Species of Special Concern (Moyle et al. 2015).

Special Status Wildlife

Based on search queries of the CNDDDB (CDFW (b) 2017), USFWS Information for Planning and Conservation species generator website (Appendix C), eBird website (eBird 2012), as well as consultation with USFWS, an exhaustive list of state and federal special-status species were identified as potentially occurring on or in the vicinity of Winter Island. However, the likelihood of many of these species occurring on site are low as Winter Island does not provide the appropriate habitat, or there have been no known populations near the Island.

Special-status wildlife species with the potential to occur under current conditions and after restoration are listed in Table 3-8. The likelihood of presence was determined by the quality of habitat found on site, known occurrences nearby, and documented observations on the island. This resulted in the following categories of likelihood for a special-status species to occur in the Project area:

- None: The species' required habitat is not present on site and no observations of the species has been documented in the Project area.
- Low: The species' required habitat either does not occur or may occur in low quality so that no observations have been made on site, but the Project area may still be within the species range.
- Moderate: The species' required habitat does occur on site and may occur nearby, but species has not been documented on site.
- High: The species' required habitat does occur on site and observations of the species have been made on site.

Table 3-8. Special-status wildlife with potential to occur on Winter Island.

Common Name (<i>Scientific name</i>)	¹ Status Federal/ State	Habitat Requirements	Likelihood to occur on site under current conditions	Likelihood to occur on site under post-restoration conditions
Reptiles				
Western Pond Turtle (<i>Actinemys marmorata</i>)	-/SSC	Permanent, slow-moving ponds, lakes, streams or pools with adequate basking sites and nearby upland for nesting	Moderate: habitat occurs on site, but lacks basking habitat; observations have been recorded nearby	Moderate: suitable habitat would remain on site
Birds				
Allen's Hummingbird (<i>Selasphorus sasin</i>)	BCC/-	Coastal scrub and chaparral along the California and southern Oregon coast	Low: suitable habitat does not occur on site, but has been documented nearby	Low: additional habitat would not be created on site
California Black Rail (<i>Laterallus jamaicensis coturniculus</i>)	BCC/ST, SFP	Tidal and freshwater marshes with shallow water; favors areas with dense clusters of cordgrass and other emergent vegetation	High: suitable habitat on site and species has been documented nearby	High: suitable habitat would be created on site
California Least Tern (<i>Sternula antillarum browni</i>) nesting colony	FE/SE	Live along the coast and nest in colonies on open beaches with minimal vegetation.	Low: within species range, but no suitable habitat occurs on site	Low: suitable habitat would not be created on site
Clark's Grebe (<i>Aechmophorus clarkii</i>)	BCC/-	Primarily in saltwater bays in the winter and freshwater wetlands during the breeding season	Low: suitable habitat does not occur on site, but species has been documented nearby	Low: suitable habitat would not be created on site
Marbled Godwit (<i>Limosa fedoa</i>)	BCC/-	Marshes, mudflats and beaches	Low: habitat on site is not ideal but could potentially be used	Low: suitable habitat would remain on site

Ridgeway's Rail * (<i>Rallus obsoletus</i>)	FE/SE	Saltwater and brackish marshes with sufficient vegetation for high tide refugia, especially utilizing pickleweed and cordgrass.	Low: suitable habitat occurs, but site at easternmost edge of species range; species has not been documented on site or nearby	Low: suitable habitat would remain on site
Saltmarsh Common Yellowthroat (<i>Geothlypis trichas sinuosa</i>)	BCC/SSC	Mostly marshes and wetlands, using low-growing vegetation to build and hide nests, but can be found in a variety of habitats.	High: suitable habitat found on site and has been documented nearby	High: suitable habitat would be created on site
Suisun Song Sparrow (<i>Melospiza melodia maxillaris</i>)	BCC/SSC	Endemic to California in tidal salt and brackish marshes	High: suitable habitat occurs on site and has been documented nearby	High: suitable habitat would remain on site
Tricolored Blackbird (<i>Agelaius tricolor</i>) nesting colony	BCC/SSC, SCT	Cattail and tule marshes, foraging in nearby open grassland and farm fields	Low: suitable foraging habitat does not occur on site or nearby	Low: suitable foraging habitat would not be created on site
Mammals				
Salt Marsh Harvest Mouse (<i>Reithrodontomys raviventris</i>)	FE/SE	Marshland dominated by pickleweed for both cover and escaping inundation at high tide; may utilize adjacent grasslands when new growth provides cover	Moderate: suitable habitat occurs on site and has been documented nearby	Moderate: suitable habitat would remain on site

1. Status

Federal

FE Federally Endangered

FT Federally Threatened

BCC Bird of Conservation Concern

-no federal status

State

SE State Endangered

ST State Threatened

SSC California Species of Special Concern

SCT State candidate for listing as Threatened

SFP CDFW Fully Protected Species

- no state status

*Ridgeway's Rail was previously known as the California Clapper Rail (*Rallus longirostris obsoletus*) but recent molecular data has suggested splitting the Clapper Rail into several different species (Maley 2012).

Invertebrates

There are several special-status invertebrates that occur near the Project area. However, these species require vernal pools, sand dunes, rocky outcrops or special vegetation that does not occur on Winter Island and have not been documented in the area. Due to the lack of habitat and presence, the following species are not further discussed in this document: Conservancy fairy shrimp (*Branchinecta conservation*), Delta green ground beetle (*Elaphrus viridis*), Lange's metalmark butterfly (*Apodemia mormo langei*), San Bruno elfin butterfly (*Callophrys mossii bayensis*), Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardii*).

Reptiles and Amphibians

There are three special-status reptiles and two special-status amphibians that occur near Winter Island. Of these, the only species with adequate habitat on the island is the western pond turtle (*Actinemys marmorata*). The other species require habitat such as rocky outcrops, vernal pools or adequate upland habitat that is not provided by the island, or Winter Island is outside the known species range. As such, these species have little to no potential to occur and are not further discussed in this document: giant gartersnake (*Thamnophis gigas*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), California red-legged frog (*Rana draytonii*), and California tiger salamander (*Ambystoma californiense*).

Western Pond Turtle

The western pond turtle (*A. marmorata*) is a California Species of Special Concern, and is currently being considered for listing under the state and federal Endangered Species Acts. It is a primarily aquatic turtle that is endemic to western North America and ranges from Puget Sound, Washington south to Baja, Mexico (Zaragoza et al. 2015). Western pond turtles have been found to inhabit permanent and ephemeral waters in ponds, lakes, wetlands, and streams in a variety of habitats with nearby upland-terrestrial habitat (Morey 2000). The most important requirements for their habitat include basking sites along the water such as logs and branches, and adequate terrestrial habitat for nesting and hibernating. Observations of western pond turtles have been recorded in the CNDDB near Winter Island to the south at the nearby Dow Wetlands Preserve, and north in Solano County (CDFW (b) 2017).

Birds

There is a rather large list of special-status birds that occur in the areas surrounding Winter Island, however the majority of them are not likely to occur on the island due to lack of appropriate habitat. These species are not further discussed in this document: Allen's hummingbird (*Selasphorus sasin*), black oystercatcher (*Haematopus bachmani*), black skimmer (*Rynchops niger*), black swift (*Cypseloides niger*), black turnstone (*Arenaria melanocephala*), black-chinned sparrow (*Spizella atrogularis*), burrowing owl (*Athene cunicularia*), California least tern (*Sternula antillarum browni*), California thrasher (*Toxostoma redivivum*), Clark's grebe (*Aechmophorus clarkii*), Costa's hummingbird (*Calypte costae*), Lawrence's goldfinch (*Carduelis lawrencei*), Lewis' woodpecker (*Melanerpes lewis*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), mountain plover (*Charadrius montanus*), Nuttall's woodpecker (*Picoides nuttallii*), oak titmouse (*Baeolophus inornatus*), red

knot (*Calidris canutus spp. Roselaari*), rufous hummingbird (*Selasphorus rufus*), short-billed dowitcher (*Limnodromus griseus*), snowy plover (*Charadrius alexandrinus*), San Clemente spotted towhee (*Pipilo maculatus clementae*), whimbrel (*Numenius phaeopus*), willet (*Tringa semipalmata*), wrentit (*Chamaea fasciata*), and yellow-billed magpie (*Pica nuttalli*).

California Black Rail

The California black rail (*Laterallus jamaicensis coturniculus*) is a state threatened and fully protected species, as well as a federally recognized bird of conservation concern. It is found in tidal and freshwater marshlands that have dense clusters of emergent vegetation such as cord grass (*Spartina spp.*), pickleweed, and cattails (Spautz and Nur 2002, Takekawa et al. 2011). It is found primarily in San Francisco Bay tidal marshes, including Suisun Bay, and relies upon vegetation to hide, nest, feed and escape during tidal inundation. Observations have been recorded at the Dow Wetlands Preserve, as well as at Browns and Sherman Islands-all of which closely surround the Winter Island. Black rails use emergent vegetation to build their nests higher up into the marsh where they are generally safe from flooding.

Ridgeway's Rail

Ridgeway's rail (*Rallus obsoletus*) is listed as endangered under both the state and federal Endangered Species Acts and is found in brackish and saltmarsh habitats primarily dominated by pickleweed and cordgrass throughout the San Francisco Bay area and into Suisun Bay (U.S. Environmental Protection Agency 2010). It utilizes these and other emergent vegetation to hide from predators, forage, and build nests. Inland channel marshes are also important, as they provide the opportunity for rail to feed on the invertebrates exposed during a receding tide (Takekawa et al. 2011). Research has shown that they may utilize invasive hybrid species of cordgrass to expand into higher portions of the marsh to escape high tides, while still retaining cover (Overton et al. 2014). The breeding season occurs from March through July, when nests are built in emergent vegetation at lower regions of the marsh. Ridgeway's rail was previously classified as a subspecies of Clapper Rail (*R. longirostris*); however, recent genetic work has shown that the two species are genetically distinct (Maley 2012). Though Winter Island has no stands of cordgrass, the island has sufficient vegetation and habitat to possibly sustain populations of Ridgeway's rail, but is on the eastern boundary of the species range and has not been documented on site.

Saltmarsh Common Yellowthroat

The saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*) is a state species of special concern as well as a federal bird of conservation concern. It is a subspecies of the common yellowthroat (*G. trichas*), and is found throughout the Estuary in coastal riparian and tidal marsh habitats (Gardali and Evens 2008). Research suggests that yellowthroat success is positively correlated with wetland vegetation abundance and height (Spautz et al. 2006). Though they are able to utilize woody swamps, they are primarily found to breed in brackish marshes between March and July, using vegetation to conceal open-cup nests that are typically hidden near the ground (Gardali and Evens 2008). Vegetation surveys conducted on Winter Island indicate that suitable habitat is available and observations of this species have been documented as recently

as November 2017 at the nearby Dow Wetlands Preserve, as well as at the neighboring Browns Island directly to the west of Winter Island.

Suisun Song Sparrow

The Suisun song sparrow (*Melospiza melodia maxillaris*) is a state species of special concern as well as a federal bird of conservation concern. It is a subspecies of the more common song sparrow (*M. melodia*) endemic to California and can only be found in and around Suisun Bay. It spends the entire year within its breeding range, inhabiting tidal salt and brackish marshes. Dense vegetation provides cover and nesting habitat, though it must not be dense enough to prevent foraging for plant and animal matter on exposed ground. This species breeds from March through July, and uses a wide variety of plant species for building nests, including tules, pepperweed, and rushes (*Juncus* spp.). Suisun song sparrows are heavily associated with tidal channels, which individuals partition for use, and are also positively associated with large marshes adjacent to natural upland habitat (Spautz and Nur 2008). Suitable habitat for this species is present on Winter Island, and observations have been made at the neighboring Browns Island and Sherman Island, as well as Dow Wetland Preserve.

Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) is a state threatened species and is also recognized as a federal bird of conservation concern. This species has primarily been listed to protect nesting colonies. While the majority of tricolored blackbirds are found throughout California, particularly in the Central Valley, there are a few small populations that occur in Oregon, Washington, and Baja California. They breed from March through July, building nests into cattails, bulrush, and Himalayan blackberry (Hamilton 2004). Breeding locations must have sufficient vegetation to hide and protect nests, near open, accessible water, and within a few kilometers of suitable foraging areas (Beedy 2008). In the winter, they are known to inhabit the Delta in large flocks with other blackbird species before dispersing once again around February. Tricolored blackbirds have been observed at and east of the nearby Dow Wetlands Preserve, and to the north near Collinsville. Though Winter Island occurs within the breeding range of this species, studies have indicated that breeding is unlikely to occur near the island (Ballard 2004).

Mammals

There are two special-status mammals that occur within the general Project area. Suitable habitat for one of these species, the San Joaquin kit fox (*Vulpes macrotis mutica*), does not occur on Winter Island and therefore will not be further discussed in this document.

Salt Marsh Harvest Mouse

The salt marsh harvest mouse (*Reithrodontomys raviventris*) is a federal and state listed endangered species. It primarily inhabits marshlands with pickleweed and other emergent vegetation which it uses to escape rising waters at high tide and avoid predators. In areas with unfragmented habitat, the salt marsh harvest mouse is better capable of outcompeting invasive house mice (Bias and Morrison 2006). Newer research shows that salt marsh harvest mice may actually utilize a greater variety of habitats than previously thought, and may prefer feeding on rabbit's food grass and fat hen over pickleweed (Smith 2017). Though salt marsh harvest

mouse surveys have not been conducted on Winter Island, they have been documented at neighboring sites within a 5-mile radius, including Van Sickle Island to the northwest, the Dow Wetlands Preserve to the south, and Lower Sherman Island Wildlife Area to the east (Laureen Barthman-Thompson personal communication 2018).

3.4.2 Discussion

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than significant with mitigation incorporation

Special-Status Plants

Construction activities at the north and south water control structure could displace two special-status plant species, Mason's lilaeopsis and Suisun Marsh Aster (Figure 3-8 and Figure 3-9). Though plant surveys were not conducted at the eastern channel, special-status species are unlikely to occur due to the highly energetic nature of the wetland and small existing channel and the presence of dense tules and cattails; however, impacts to individuals found during construction would be minimized and avoided. Impacts to special-status plant species would be reduced to less than significant levels by implementing the following measures:

Mitigation Measure Bio-1: Avoid and minimize impacts to special status plants.

A qualified biologist shall conduct pre-construction surveys for special-status plants prior to all construction activities. If special-status plants are identified in the Project area, they shall be flagged and avoided. If any special-status plants cannot be avoided, an attempt shall be made to transplant the individuals to suitable habitat after consultation with CDFW.

Mitigation Measure Bio-2: Biological Monitor

A qualified biologist approved by CDFW, USFWS, and NMFS with appropriate knowledge and experience in the biology, life history, and identification characteristics of fish, wildlife, and plants that are likely to be encountered during Project activities shall be present during all construction activities. This monitor shall also be given the authority to halt any work they deem may be a cause for concern that may endanger fish, wildlife, or plant species or resources.

Mitigation Measure Bio-3: Environmental Awareness Training

Prior to construction activities, all construction personnel would receive environmental awareness training from a qualified biologist approved by CDFW, USFWS, and NMFS. This training shall educate construction personnel in a brief overview of the life history of special-status species that are likely to be encountered on site, legal protections and penalties for unauthorized take, and explain the relevant environmental commitments and mitigation measures.

Special Status Fish

Removal of the north and south water control structures, as well as construction of the eastern channel, could cause temporary impacts to special status fish inhabiting the waters within and surrounding the Winter Island. Indirect impacts include temporary increases in turbidity and contaminant loads from excavation, noise disturbance, and loss of habitat. Direct impacts may include physical damage, stress, and/or mortality. Impacts would be avoided by minimizing construction related turbidity (WQ-1), having a qualified biologist onsite during all construction activities (Bio-2), requiring environmental awareness training for all personnel (Bio-3), and conducting work at a time when special status fish are least likely to be present (Bio-4).

Mitigation Measure Bio-4: In-water Work Window

All in-water work shall be limited to August 1 through October 31, a timeframe set by CDFW, USFWS, and NMFS as a time when special status fish are least likely to be present.

Delta Smelt

Delta Smelt are known to occur in waterbodies surrounding Winter Island and would likely be present during construction activities. However, only juvenile and adult fish, individuals that are capable of actively swimming, are expected to be present during the in-water work window. Noise levels from barge movement and excavation would not reach thresholds known to cause damage to fish, but would likely deter individuals from occupying the aquatic habitats near construction activities. Temporarily increased turbidity due to excavation could cause gill damage to individuals, though sedimentation during construction activities would be minimal and localized as released sediment particles would diffuse throughout the large water bodies surrounding the excavated areas. In-water work would only occur during low or incoming tides and a silt curtain or similar device would be used as needed (Mitigation Measure WQ-1), further reducing potential turbidity impacts to Delta Smelt.

Chinook Salmon

Though monitoring surveys indicate that Chinook Salmon are rarely present during summer and early fall, when temperatures in the Delta peak, there is still potential for individuals to be present during the in-water work window. Impacts to salmon may include bodily injury, gill damage, and stress. However, individuals are expected to respond to construction noise and actively avoid the areas surrounding construction activities. Sediments entering the waterway during excavation could cause temporary turbidity increases, but turbid inputs are expected to quickly dissipate when entering the surrounding water bodies. Noise levels would not reach decibels known to harm fish.

Other Listed Fish

Other special-status fish are unlikely to occur in the waters surrounding Winter Island during the in-water work window. White and Green Sturgeon typically inhabit deep channel habitats and are unlikely to be foraging along the shoreline of Winter Island during daylight hours. Adult Lamprey primarily migrate upstream in spring, while juveniles exhibit nocturnal emigration during high outflow events in winter and spring (Goodman et al. 2015; Moyle et al. 2015). Hitch

and Splittail occupy shallow water habitats and may be present during the in-water work window; however, individuals would be able to swim away from construction activities. In addition to adhering to the in-water work window and turbidity control measures (See WQ-1 in Section 3.9 – Hydrology and Water Quality), impacts to fish would be avoided by implementing proper chemical storage measures and having a spill response plan (See HM-1 and HM-2 in Section 3.8 – Hazards and Hazardous Materials).

It is unlikely that special status fish occupy the internal portions of Winter Island due to limited site access. Underwater noise from construction equipment would likely deter fish from remaining or entering the interior. Impacts to special-status fish would be less than significant with mitigation.

Special Status Wildlife

According to Table 3-8, there are several special-status species that may be present in the Project area that could be detrimentally affected by Project activities. Vehicle movement, vegetation removal, and excavation could cause direct mortality and/or harm to individuals, nests, and burrows. Noise associated with construction activities may also indirectly cause birds to abandon nests. By utilizing appropriately timed avoidance windows and minimization measures, impacts to special-status wildlife would be reduced to less than significant.

Western Pond Turtle

Winter Island may provide sufficient aquatic and upland habitat for western pond turtles. Though no observations have been recorded on site, the species has been documented nearby at Dow Wetlands Preserve and throughout Solano County. Project activities could impact individuals through direct mortality, disturbance, and temporary loss of habitat. To avoid impacts, a qualified biologist would be on site during all construction activities (Bio-2), environmental awareness training would be given to all individuals working on site (Bio-3), and construction machinery would be limited to designated access routes (Bio-8). Furthermore, impacts to western pond turtle would be less than significant by implementing the following mitigation measure:

Mitigation Measure Bio-5: Western Pond Turtle Surveys

A qualified biologist shall identify suitable western pond turtle habitat and conduct daily surveys for individuals within the construction areas. If a western pond turtle is identified within an area where active construction is occurring, work shall not proceed until the turtle has moved, on its own, out of the area. A qualified biologist may move an individual after receiving permission from CDFW.

Nesting Birds

Winter Island may serve as nesting habitat to several special status bird species. There is upland habitat available for nesting, though it is mostly low-quality rip rapped levee. Most suitable nesting habitat is within the emergent marsh vegetation on the island interior. Construction activities that occur during breeding season could have direct and indirect effects on nesting birds by disturbing vegetation required for nesting or causing nest abandonment. In

addition to Bio-1 and Bio-2, impacts to nesting birds would be avoided and reduced to less than significant levels by incorporating the following measure:

Mitigation Measure Bio-6: Breeding and Nesting Bird Avoidance

Site preparation and construction activities shall take place outside of nesting season (February 1–August 31) to avoid disturbance to California black rail, Ridgeway's rail, and other nesting birds. If construction activities must take place during the nesting season, additional minimization and avoidance measures shall be implemented upon consultation with USFWS and CDFW. Ground disturbing activities shall not occur during the nesting season without written approval from regulatory agencies.

The Project would enhance the quality of the habitat available on the interior portions of Winter Island. Restored tidal flows are expected to import sediment, cause the existing duck ponds to fill in, and create additional emergent wetland habitat over time. Furthermore, improved aquatic access to the site may allow the interior wetland habitat to become more productive and improve the availability of prey items, such as small fish and invertebrates, for bird consumption.

Salt Marsh Harvest Mouse

Impacts to salt marsh harvest mouse could occur during construction of the north and south breaches where suitable habitat occurs. While no surveys have been conducted on Winter Island, there have been several observations of the salt marsh harvest mouse in the surrounding area, including at Van Sickle Island, the Dow Wetlands Preserve, and Lower Sherman Island Wildlife Area. Though the species has the potential to occur on Winter Island, suitable upland refugia is limited to the external levees and southwestern portion of the island. Overtopping occurs along the eastern levee during storm and high water events, making the habitat unsuitable as high water refuge. Creation of the eastern channel is not expected to result in impacts to individuals, as most construction would occur away from upland refugia, where mice are not likely present. To prevent potential impacts, a qualified biologist would be on site during construction activities (Bio-2) and environmental awareness training would be mandatory for all personnel working on site (Bio-3). In addition, the following best management practices (BMPs) would be implemented to reduce potential impacts to less than significant.

Mitigation Measure Bio-7: Salt Marsh Harvest Mouse BMPs

The following BMPs shall be implemented for all phases of the Project:

- A qualified biologist shall identify suitable habitat prior to construction initiation and shall be present on site during all construction activities.
- Disturbance to suitable habitat on levees and upland areas shall be avoided to the extent feasible. All vegetation removal on the levees shall be conducted using hand tools before ground disturbing activities begin. Vegetation shall be cleared to bare ground or stubble no higher than 1 inch.
- Exclusion fencing shall be installed around all upland construction areas, including the north and south breach locations, after vegetation removal and prior to the initiation of construction activities. The exclusion fencing shall be taut between

supporting stakes and buried to a depth of 6 inches. A qualified biologist shall inspect the exclusion fencing daily for holes or tears.

- Vegetation removal and exclusion fencing installation in suitable upland areas shall not occur during extreme high tides (6.5 feet or higher), when mice may be seeking refuge.
- All construction equipment shall be stored within excluded areas or away from suitable habitat when not in use.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than significant impact

A limited amount of riparian habitat occurs on the upland portions of the Winter Island; however, it is dominated by nonnative species like blackwood acacia, tree-of-heaven, and Himalayan blackberry. Native riparian species would not be impacted by Project activities, but some nonnative species would be removed near the construction areas to improve habitat conditions and promote recolonization by natives. Impacts to riparian habitat would be less than significant.

Winter Island and the surrounding area is classified as coastal brackish marsh. Most Project-related impacts would occur to uplands at the breach locations, though some coastal brackish marsh may be temporarily disturbed during construction. The Project would improve the quality of the brackish marsh within Winter Island by restoring the island to full tidal conditions. Impacts to sensitive natural communities would be less than significant.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than significant with mitigation incorporated

The purpose of the proposed Project is to restore tidal flows and fish access to Winter Island. To accomplish this, some temporary and permanent impacts to wetlands protected under Section 404 of the Clean Water Act would occur. Construction related impacts to existing resources would be avoided and reduced to less than significant levels by implementing the following construction BMPs:

Mitigation Measure Bio-8: Construction BMPs

The following construction BMPs shall be followed during all phases of the Project:

- Construction equipment shall be operated from upland berms, levees, or by barge wherever possible.
- Rip rap shall only be placed as necessary for breach function and armoring

- Unused riprap, trash, and debris removed during construction activities within wetland habitat shall be disposed of at a Class II or Class III Landfill, depending upon local regulations.

At the north and south breaches, fill would be excavated and the existing water control structures and rip rap would be removed, causing temporary turbidity impacts to the surrounding open water and wetland habitats. Rip-rap reuse at the southern breach would not further impact any aquatic habitat, as it would occur in areas currently armored. Approximately 0.04 acres of freshwater perennial emergent wetland would be permanently converted into tidal waters of the US. Excavation of the eastern channel may also cause a temporary increase in suspended sediments and would temporarily impact 1.65 acres of freshwater perennial emergent marsh from fill placement. Vegetation is expected to quickly reestablish in the impacted area. An additional 0.15 acres of freshwater perennial emergent marsh would be permanently converted into open water.

Upon project completion, muted tidal habitats and 0.4 acres of upland would be permanently converted into fully tidal habitats (Table 2-1). The mean higher high water inside the island would increase by 0.65 feet NAVD88 and mean lower low water would decrease by 1.42 feet (Table 2-2). The Project area would no longer be managed as a duck club and ponds that were kept clear for hunting purposes would be allowed to fill in with sediment and wetland vegetation. The converted habitats would be protected in perpetuity under a conservation easement.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than significant with mitigation incorporation

Fish

Construction activities could temporarily interfere with fish movement, though interference is unlikely to be significant. As Winter Island has limited hydrologic access, it is unlikely that migratory fish would be found on the island interior; most disturbance would come from construction activities on the exterior of the island. Migratory fish would have an abundance of open water and channel margin habitat to choose from away from the construction sites. Resident fish may be found throughout the interior marsh habitat, but the construction footprint is small compared to the available habitat and should not interfere with daily movement. Potential impacts to resident and migratory fish would be avoided by conducting in-water work when fish presence is less likely (Bio-4) and conducting work within wetlands during low tide. Impacts to fish would be less than significant with the incorporated mitigation.

Wildlife

There are no known rookeries on or near Winter Island, but construction disturbance could interfere with breeding or movement. Interference would be minimized with pre-construction avoidance surveys (Bio-1), educating construction personnel on special-status wildlife (Bio-3), timing activities outside breeding periods (Bio-6), and by having a qualified biologist on site (Bio-

2). The qualified biologist would have the ability to halt work if there is evidence of disturbance among nesting birds. Impacts to resident or migratory wildlife would be less than significant.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No impact

The purpose of the Project is to enhance the wetland and aquatic habitat within Winter Island and make it more accessible to aquatic species. The Project would not conflict with any local policies or ordinances and therefore, would have no impact.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No impact

Winter Island is not within the inventory area for the East Contra Costa County Habitat Conservation Plan, nor any other plan and therefore, there would be no impact.

3.5 Cultural Resources

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remain, including those interred outside of formal cemeteries?		X		

3.5.1 Environmental Setting

Bay Miwok

Winter island lies within an area formerly inhabited by the Bay Miwok people (also referred to as Mi-Wuk) prior to Euro-American settlement in the late 1700s. “Tribelets”, the primary political unit of the Miwok, controlled specific territories across the Delta to the Carquinez Strait. Tribelets averaged between 300-500 individuals with one main village and additional satellite villages. Villages contained semi-subterranean or aboveground conical houses made with tule matting, acorn granaries, inter-grinding houses, and conical sweathouses. A principal Bay Miwok village was located southwest of the Project area, near present-day Pittsburg.

Regional History

Spanish colonization of the Delta began in 1769 and within three decades, most of the Bay Miwok were relocated and baptized at established Franciscan Missions. Following the Mexican Revolution (1810-1822), Mexico achieved independence and acquired all Spanish holdings in North America, including California. California Land Grants given to Mexican citizens were primarily located in the state’s interior to encourage movement into less populated areas. One of the areas granted, Rancho Los Medanos, was an 8,859-acre property that included the present-day Antioch and Pittsburg area given in 1839 to Antoni Mesa and Jose Miguel Garcia. Following the Mexican-American War (1846-1848), Mesa and Garcia divided and sold off their Rancho to Americans.

The discovery of gold in the Sierra Foothills in 1848 led to a mass migration of immigrants to California. Due to the sudden population increase, settlers quickly began cultivating crops along the Sacramento and San Joaquin Rivers and reclaiming delta marshlands for agricultural use. The Swampland Act of 1850, which gave states authority over all swamp and overflow land, as

well as the introduction of mechanical dredging in the 1870s, further expedited land reclamation. By the turn of the twentieth century, the Delta became one of the leading agricultural regions in the state, producing crops including celery, tomatoes, asparagus, fruit, and grains.

Site History

Historically, Winter Island was a tidal marsh, likely dominated by tules and cattails. The island was acquired by Captain George Washington Kimball in 1872 under the auspices of the Swamp Land Act of 1850. Settlement and development of the island began in 1873 by William Winter, the island's second owner and for whom it is named after. William Winter used the property as pastureland and constructed a home, barns, and other outbuildings. In 1887, William sold the island to Erastus Kelsey, who then sold the property to the Co-Operative Brotherhood of Winter Island (Brotherhood), a socialist organization Erastus helped establish in 1893. During the Brotherhood's seven-year ownership, the island's exterior levee system was constructed and various types of crops were cultivated, including tomatoes, onions, grapes, berries, and hay. Due to the Panic of 1893, the subsequent economic depression, conflicts between the organization's members, and declining membership, the Brotherhood defaulted on their mortgage in 1901 and Winter Island was returned to Kelsey.

Following the failed attempts of the Brotherhood, Winter Island was predominately managed and maintained for duck hunting purposes under various ownership. The island has also been used as a disposal site for numerous dredging operations, including the Stockton Deepwater Ship Channel Deepening Project. Dredge spoils have predominately been placed on the island's levees to combat erosion.

Surveys

A cultural resources literature search was performed by the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University on November 11, 2016. The search encompassed 0.25-mile radius area of the Project area and included archeological and historical records and a literature review. As a result, NWIC found that there were no cultural resource studies previously conducted, and that there were no documented cultural resources present within the search area.

A field survey was conducted by Parus Consulting Inc. on December 14, 2017 on the accessible dry land portions of the Project area. Three potentially significant historic resources were identified:

- *The Winter Island Barn*: A wood framed building located on the southern end of the island that measures approximately 33 feet long and 25 feet wide. The Barn was constructed in 1895 by the Brotherhood for their agricultural operations.
- *The Winter Island Perimeter Levee*: An earthen levee that wraps around the outer edge of the island constructed for flood prevention. Initial construction of the levee began in the mid-1890s by the Brotherhood.

- *The Central Drainage Ditch*: An earthen ditch that cuts across the length of Winter Island, approximately 1.9 miles. Construction of the ditch began in approximately 1895 and was completed in 1910.

The historical significance of each identified structure was assessed using the National Register of Historic Places (NRHP) criteria and the California Register of Historical Resources (CRHR) criteria. Structure integrity was determined by applying the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. None of the structures were deemed eligible for listing in the NRHP or CRHR and therefore do not qualify as historic properties or historical resources. Further details of the historic resource evaluation are provided in Appendix E.

Native American Correspondence and Consultation

The Native American Heritage Commission (NAHC) was contacted on October 18, 2016 to request for a Sacred Lands File Search and Native American contacts list for the Project area. The NAHC responded on October 24, 2016 with a negative result of potential sacred lands in the Project area but provided a list of Native American tribes that may have knowledge of cultural resources in the Project area. DWR staff archaeologists sent project notification letters on January 22, 2017 to the following the tribes:

- Amah Mutsun Tribal Band of Mission San Juan Bautista
- Muwekma Ohlone Indian Tribe of the San Francisco Bay Area
- Ohlone Indian Tribe
- Indian Canyon Mutsun Band on Costanoan
- Witlon Rancheria (letter returned but re-sent by certified mail February 6, 2017)
- North Valley Yokuts Tribe

Follow up phone calls and emails were attempted on February 10, 2017. Tribal responses to these inquiries were as follows:

- Amah Mutsun Tribal Band of Mission San Juan Bautista – phone number disconnected, no response to letter or email communication.
- Muwekma Ohlone Indian Tribe of the San Francisco Bay Area – no email provided, no response to letter or voicemail message.
- Ohlone Indian Tribe– no email provided, no response to letter or voicemail message.
- Indian Canyon Mutsun Band on Costanoan – spoke with Chairwoman Sayers by phone. The Chairwoman requested notification of survey results and that monitors be present if prehistoric resources are found during the surveys.
- Witlon Rancheria – Formal letter requesting to consult with DWR about the project (see below for details).
- North Valley Yokuts Tribe – no email provided, no response to letter or voicemail message.

DWR received a letter to consult on the project under Public Resources Code 2180.3.2. The letter was dated March 1, 2017 but was postmarked March 23, 2017. The postmarked response date fell outside the 30-day window to request consultation specified under Public Resources

Code 2180.3.1(d); however, DWR is committed to continued communication with the tribe under the California Natural Resources Agency's Tribal Engagement Policy and DWR's Tribal Engagement Policy. A meeting with the tribe is planned.

3.5.2 Discussion

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

No Impact

Three structures were identified during archival searches and surveys as potential historical resources: the barn, perimeter levee, and the central drainage ditch. However, none of these existing features were found to be historically significant using NRHP and CRHR criteria (see Appendix E); therefore, there would be no impact.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less than significant with mitigation

No archaeological resources have been identified in the Project area. It is unlikely that intact archaeological deposits would be encountered during Project activities; however, there is still the potential for artifacts or other cultural deposits to be discovered during construction. Potential impacts to archaeological resources would be mitigated by implementing the following measures:

Mitigation Measure CR-1: Cultural Awareness Training

Prior to construction activities, all construction personnel would receive cultural resources awareness training. This training may be presented as part of a larger environmental training and shall educate construction personnel on what types of resources are most likely to be encountered in the area, the procedures to follow if cultural resources are observed during construction, and DWR policy concerning the confidentiality of cultural resources information.

Mitigation Measure CR-2: Impacts to Unknown Archaeological Resources

If previously unidentified archaeological materials are unearthed during construction, work will halt within 100 feet of the find until a qualified archaeologist can assess the significance of the resource as required by California Public Resources Code Section 15064.5(f). Should significant or unique archaeological resources be found, the resources shall be treated in compliance with California Public Resources Code Section 21083.2. If the project can be modified to accommodate avoidance, avoidance and preservation in place is the preferred alternative.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No impact

No paleontological resources or unique geological features were identified during archival searches and surveys; therefore, there would be no impact.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less than significant with mitigation

No formal cemeteries or human remains have been identified in the Project area. It is unlikely that human remains would be encountered during Project activities; however, there is still the potential for remains to be discovered during construction. Potential impacts to human remains would be mitigated by implementing the following measure:

Mitigation Measure CR-3: Impacts to Unknown Human Remains

If human remains are found, such remains are subject to the provisions of California Public Resources Health and Safety Code Section 7050.5-7055. The requirements and procedures shall be implemented, including immediately stopping work within 100 feet of the find and notification of the Contra Costa County Coroner. DWR would follow the process for notification of the California Native American Heritage Commission (NAHC) and consultation with the individual(s) identified by the NAHC as the “most likely descendent” as set forth in Section 5097.98 of the California Public Resources Code. Work can restart after the remains have been investigated and appropriate recommendations have been made for the treatment and disposition of the remains.

3.6 Geology and Soils

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

3.6.1 Environmental Setting

Winter Island is composed predominately of marsh muds and peats that accumulated throughout the Holocene (<11,000 years before present) (Atwater 1982, Helley and Graymer 1997). This process of tidal marshland formation occurred throughout the Delta region until land reclamation began in the late 1800s during Euro-American settlement (Whipple et al. 2012).

Reclamation entailed levee construction around the Delta islands to facilitate agricultural practices absent of annual flooding that once supported the marsh setting. Oxidation of the drying peat soils has led to its depletion and, thus, subsidence of the Delta islands, including Winter Island. Previous landowners have attempted to maintain the external levee using dredge spoils, debris, and sunken barges. Dredge placement has occurred mostly on the eastern levees where erosion is more prominent.

The soils on Winter Island have been classified as Joice muck, which is generally found in flat salt marshes and characteristic of waterfowl hunting areas. The soil forms under poor drainage conditions and allows for very slow runoff and rapid permeability. Joice Muck is considered a hydric soil as defined by the Natural Resources Conservation Service (2017).

The project is located in the downstream end of the Sacramento-San Joaquin Delta. The Delta contains few faults, and seismic hazards are mostly associated with active faults in the adjacent Coast Range province. The Hayward Fault Zone lies about 32 miles to the southwest of the Project area. The closest “active” faults¹ designated by the California Geological Survey (CGS) are the Greenville Fault Zone and Green Valley-Concord fault zones, located about 14 mi to the southwest and 13 miles to the west, respectively (Bryant and Hart 2007, CGS 2010). Several faults with evidence of Quaternary, but not recent, displacement are close to the project site including the Hills Fault and the Davis Fault. (Unruh and Hitchcock 2009, CGS 2010).

The Green Valley-Concord Fault has an estimated slip rate of 2–8 mm/year (USGS 1999), and the USGS estimates a 16% probability that the Green Valley-Concord Fault and the nearby Greenville fault will experience an earthquake of magnitude 6.7 or greater by the year 2043 (Aagaard et al. 2016). Although the susceptibility to earthquake-induced landslides and liquefaction has not been investigated for Winter Island, it has been recently investigated in nearby Jersey Island. Jersey Island has similar geology to Winter Island, but is located 7 miles further from the Green Valley-Concord Fault. The CGS (2018) mapped Jersey Island as a potential liquefaction zone but not susceptible to earthquake-induced landslides. It is reasonable to expect that the hazards are similar in Winter Island. Delta levees may fail following a large earthquake on any of the nearby faults (Mount and Twiss 2005), but to our knowledge the stability of the levees on Winter Island has not been investigated.

3.6.2 Discussion

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

¹ An “active fault” is defined by the California Geological Survey as a fault having surface displacement within the Holocene epoch, or the past 11,000 years (Bryant and Hart 2007).

No impact

According to the most recent Alquist-Priolo Fault Map (CGS 2015), Winter Island is not in an Earthquake Fault Zone; therefore, there would be no impact.

ii) Strong seismic ground shaking?

Less than significant

The Project does not include the building of structures and will not result in a significant increase in visitation to Winter Island. According to the DOC's Ground Motion Interpolator, the potential for ground motion is around 40% (CGS 2008). The most recent earthquake caused by the Concord fault was in 1955, and it has shown indications of microseismic activity (CGS 2010). There is a greater than 50% chance that an earthquake of magnitude 5.0-6.0 will occur on the Concord fault within the next 50 years, and a 15-50% chance that an earthquake of magnitude 6.0-7.0 will occur (Contra Costa County General Plan 2005). The degree to which the current levees surrounding the island would be stable during large earthquakes is unknown. Because no structures would be built in the Project area and the island would continue to be only accessible by boat, impacts of the Project would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less than significant

Due to the constant soil saturation across most of Winter Island, there is a high potential for liquefaction during seismic activity (Contra Costa County General Plan 2005). However, since the Project will not include the building of structures or result in a significant increase in public visitation, this impact would be less than significant.

iv) Landslides?

No impact

The Contra Costa County General Plan (2005) does not show the Project area to be in a location susceptible to landslides. This, in addition to the flat topography of Winter Island, suggests that there would be no impact from landslides.

b) Result in substantial soil erosion or the loss of topsoil?

Less than significant

The Project would involve breaching the north and south levees on Winter Island, as well as dredging a channel on the eastern side of the island. Hydraulic modeling for these breaches predicts that peak velocities created by breaching would be 3-5 feet per second (Appendix F), which is intended to be high enough to limit sediment deposition based on typical scour thresholds (Fischenich 2001). During construction, temporary soil disturbance from dredging and excavation of the breaches is not expected to result in substantial soil erosion or loss of topsoil. Although the larger (southern) breach will be armored with riprap relocated from the

exterior of the levee to be breached, some short-term erosion is expected along the northern and eastern breach locations following construction. Emergent vegetation is expected to quickly reestablish along the edges of the northern and eastern breach locations to limit expansion of any potential scour zone.

The contractor would adhere to the requirements of the Construction General Permit, which would include a Storm Water Pollution Prevention Plan, to prevent erosion and sediment discharges to receiving waters, including the use of silt curtains for any in-water work as necessary. With implementation of erosion control BMPs and adherence to permits, impacts would be less than significant.

c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less than significant

According to the Contra Costa County General Plan (2005), the Project area is not susceptible to landslides, though it is in an area susceptible to flooding. Soil and vegetation disturbance would only occur at the breach and channel excavation areas, and the remainder of the island is fully vegetated. Soils would not be imported to the site and onsite dredge disposal no longer occurs. The Project would not result in significant changes to the existing soil stability conditions; therefore, impacts would be less than significant.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

No impact

While the Joice muck soils within the Project area are expansive soils, they would not prevent the restoration of tidal habitat. In addition, there would be no structures built on Winter Island, nor would there be a significant increase in visitation; therefore, there would be no impact.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No impact

Septic or wastewater disposal systems are not part of the Project; therefore, there would be no impact.

3.7 Greenhouse Gas Emissions

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				X

3.7.1 Environmental Setting

In May 2012, DWR adopted the Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (GGERP), which details DWR's efforts to reduce its greenhouse gas (GHG) emissions (GHG emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (Assembly Bill (AB) 32). DWR also adopted the Initial Study/Negative Declaration prepared for the GGERP in accordance with the CEQA Guidelines review and public process. The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices. The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

DWR specifically prepared its GGERP as a "Plan for the Reduction of Greenhouse Gas Emissions" for purposes of CEQA Guidelines section 15183.5. That section provides that such a document, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Because global climate change, by its very nature, is a global cumulative impact, an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable." More specifically, "later project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG emissions reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines § 15183.5, subd. (b)(2).)

Section 12 of the GGERP outlines the steps that each DWR Project will take to demonstrate consistency with the GGERP. These steps include: 1) analysis of GHG emissions from construction of the proposed Project, 2) determination that the construction emissions from the Project do not exceed the levels of construction emissions analyzed in the GGERP, 3)

incorporation of DWR's project level GHG emissions reduction strategies into the design of the Project, 4) determination that the Project does not conflict with DWR's ability to implement any of the "Specific Action" GHG emissions reduction measures identified in the GGERP, and 5) determination that the Project would not add electricity demands to the SWP system that could alter DWR's emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

Calculations were performed based on construction equipment use, workforce transport, and material transport (Appendix G). The Project determined via a DWR Consistency Determination (Appendix G) to be consistent with the GGERP.

3.7.2 Discussion

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than significant

Based on the analysis provided in the GGERP and the demonstration that the Project is consistent with the GGERP, the Project's incremental contribution to the cumulative impact of increasing atmospheric levels of GHGs would be less than cumulatively considerable; therefore, impacts would be less than significant.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

No impact

The GGERP is in compliance with all applicable plans and policies. This Project is in compliance with the GGERP and all BMPs suggested in the GGERP would be either incorporated in the Project description or not applicable to the Project; therefore, the Project would have no impact.

3.8 Hazards and Hazardous Materials

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials?		X		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		X		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?				X

3.8.1 Environmental Setting

Both the California State Water Resources Control Board (SWRCB) GeoTracker and California Department of Toxic Substances Control EnviroStor databases indicate that Winter Island is not a current toxic cleanup site and without imminent threat of hazards or hazardous materials. However, potential hazards and hazardous wastes were identified related to the historic uses of Winter Island.

Winter Island was used as a disposal site for the USACE Dredge Disposal Management Office. Dredge materials from the San Francisco Estuary were reused for levee maintenance and repair. While most dredge deposits satisfied wetland and upland screening criteria for reuse, a few deposits tested high for pesticides. In March of 2002 and April of 2003, dredge material from San Rafael Creek was deposited along Winter Island's levees. About 12,000 cubic yards of the dredge material was deposited on the eastern levee near the proposed eastern connector channel (Figure 3-10). This material, which was deposited over a ½ mile segment of levee, tested high in chlordane and 4,4-DDT when it was deposited. The tested values exceed the screening criteria for wetland surface reuse. In 2014, aggregate base was placed on the contaminated deposition site.

Before acquisition by DWR, Winter Island functioned as a private duck club. As such, infrastructure was placed throughout the island, including duck blinds, boat docks, storage sheds, water control structures and bulkheads, and barges. Wooden pilings are treated with creosote and bulkhead timbers are pressure treated lumber with a copper-based preservative. Paint chips from the old boat dock and shed were tested and show no lead residue.



Figure 3-10. Locations of the United States Army Corps of Engineers dredge deposits that did not pass wetland reuse criteria.

3.8.2 Discussion

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than significant with mitigation incorporation

Fuel, oil, lubricants, and other potentially hazardous materials associated with construction equipment would be utilized and stored on barges in the Project area. While storage would be limited to barges, construction would occur in or adjacent to designated wetland habitat with a crane mounted barge or amphibious excavator. Construction equipment, if not properly maintained, could pose a significant threat to the environment through leaks or spills of hazardous materials. Mitigation Measures HM-1 and HM-2 are proposed to limit impacts should a leak or spill arise.

Junk and debris removed as part of the Project that contain creosote, asbestos, or other hazardous materials would be removed and stored on a barge for proper disposal at a Class II or Class III Landfill, depending upon local regulations.

Mitigation Measure HM-1: Emergency Response Training and Spill Response Plan

All personnel involved in the use of hazardous materials shall be trained in emergency response and spill control. Diesel fuel and oil shall be used, stored, and disposed of in accordance with standard protocols for the handling of each hazardous material. Contracts shall require contractors to prepare and make available for review by DWR, an Emergency Spill Response Plan.

Mitigation Measure HM-2: Hazardous Material Clean Up

Appropriate spill response materials and procedures shall be present on site to properly respond to a spill or contamination. Soil, water, junk, or debris contaminated by any hazardous materials during construction shall be properly cleaned up and disposed of off-site.

Construction of the eastern channel would increase velocities going in and out of the northern area of the island. Peak water velocities in the channel would be between 3 -5 ft/s, just enough to keep the channel clear of fine sediment. On ebb tide, water exiting the eastern connector channel would come in contact with the levee system where soils were previously deposited with dredge material that had measurable levels of contaminants (Figure 3-11). As discussed below, there is very low potential for water to erode the levee and release contaminated sediment into adjacent waterways.

In 2015, prior to DWR acquisition, large quarry run materials were deposited on the eastern levee as part of ongoing efforts to repair the 2005 levee breach. The materials were deposited along the levee north of the eastern breach and on the same levee segment as the contaminated soil. With this armoring present, the likelihood of erosion and contaminant releases from the underlying soils is minimal. Impacts would be less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than significant with mitigation incorporation

Fuel, oil, and lubricants have potential to negatively impact the environment if accidentally spilled during construction or at staging areas. Accidental spills in the upland or wetlands of Winter Island could impact wildlife and their associated habitats by causing direct mortality or indirect impacts to fitness and survival. Even with regular upkeep and maintenance, there is potential for spills and leaks from construction equipment; therefore, mitigation measures HM-1 and HM-2 are proposed above. With the mitigation incorporated, impacts would be less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No impact

The Project site is not located within one-quarter mile of an existing or proposed school; therefore, there would be no impact.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less than significant impact

Although no hazardous material sites were listed in the SWRCB GeoTracker and California Department of Toxic Substances Control EnviroStor database queries as of February 2017, based upon review of laboratory testing results of previously permitted dredged materials placed on the eastern levee at the Project site, San Francisco Regional Water Quality Control Board identified concerns related to elevated levels of Chlordane and DDT at approximately levee stations 70+00 to 90+00 shown in Figure 3-11. Although follow-up sampling conducted in 2018 showed Chlordane levels were below screening level guidelines, levels of DDT and metabolites (2,4'-DDE, 4,4'-DDD, 4,4'-DDE) were above minimum threshold effects levels in three samples. Although this suggests the potential for contaminant release due to sediment disturbance, levee materials are not targeted for excavation and an additional layer of quarry stone was placed over these deposits in 2015. With this armoring present and due to the relatively low velocities modeled along the eastern levee (Appendix F), the likelihood of erosion and contaminant releases from the underlying soils is minimal. Because records indicate that Winter Island is not listed as a current toxic cleanup site and the potential for mobilization of legacy pollutants from previously permitted dredge disposal projects is minimal, impacts would be less than significant.

WINTER ISLAND TIDAL HABITAT RESTORATION PROJECT

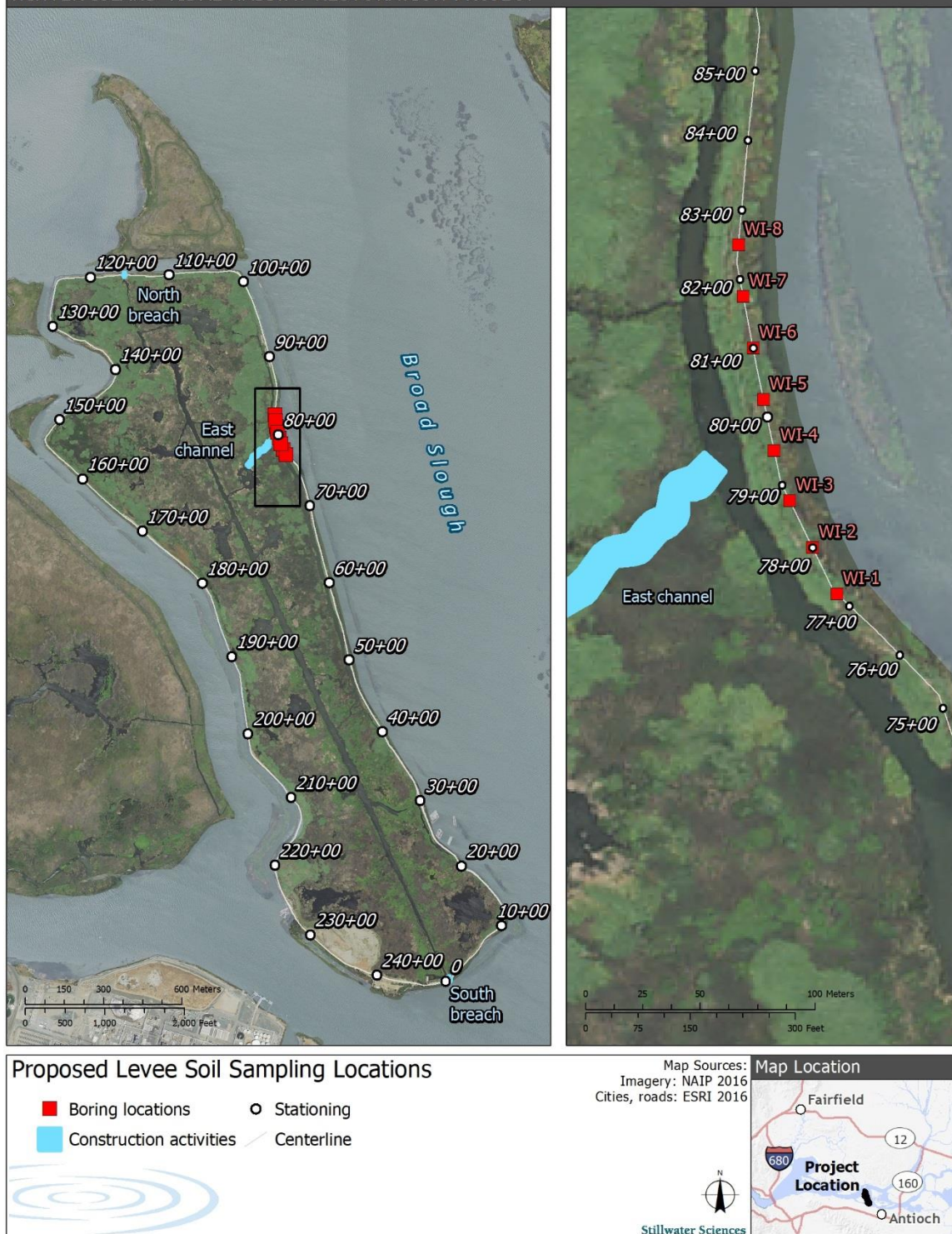


Figure 3-11. Approximate Winter Island sediment sampling locations

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No impact

There are no private or public airports within two miles of the Project site; therefore, there would be no impact.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No impact

There are no private or public airports within two miles of the Project site; therefore, there would be no impact.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No impact

The Project site is located on an island separated from the mainland roads. No impairments to traffic or road closures would occur during construction; therefore, there would be no impact.

h) Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?

No impact

The Project site is almost exclusively wetland and is not located within a wildland fire area or a high fire hazard zone. There would be no impact.

3.9 Hydrology and Water Quality

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?			X	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?				X
e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise substantially degrade water quality?			X	
g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate map or other flood hazard delineation map?				X

h) Place within a 100-year flood hazard area structures that would impede or redirect floodflows?				X
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Contribute to inundation by seiche, tsunami, or mudflow?				X

3.9.1 Environmental Setting

Winter Island is located in the western Delta and is exposed to Mediterranean-type climatic conditions. Precipitation exists entirely in the form of rain with the average rainfall in Antioch being 13.2 inches annually from 1981 to 2010. Salinity in the area varies from year to year depending on precipitation and freshwater outflow. Generally, the waterways surrounding Winter Island are more saline late spring through early winter, peaking in fall (DWR 2017).

The hydrology of Winter Island is influenced by precipitation, tidal forces, and flood flows. Located at the confluence of the Sacramento and San Joaquin River, Winter Island can experience large flood flows that overtop the eastern levee system. Winter Island has minimal upland habitat on the perimeter levee and is mostly composed of emergent marsh with interspersed open water tidal channels and ponds (Figure 3-12). Tidal exchange between the internal portions of the island and the surrounding delta is restricted; two culverts, one each at the north and south end of the island, as well as a small channel on the eastern edge are the only sources of limited exchange. Water level loggers placed on the island interior indicate that tidal exchange is muted by approximately 0.6 feet at mean higher high water and 1.42 feet at mean lower low water (Table 2-2). The bottom elevation of open water habitat within Winter Island (i.e. the central channel and established duck ponds) ranges from -1 to -2 feet NAVD88. The marsh habitat sits at between 3.5 and 5.5 feet NAVD88, though the northern end of the island gets deeper with bottom elevations slightly lower than 3.5 feet NAVD88.

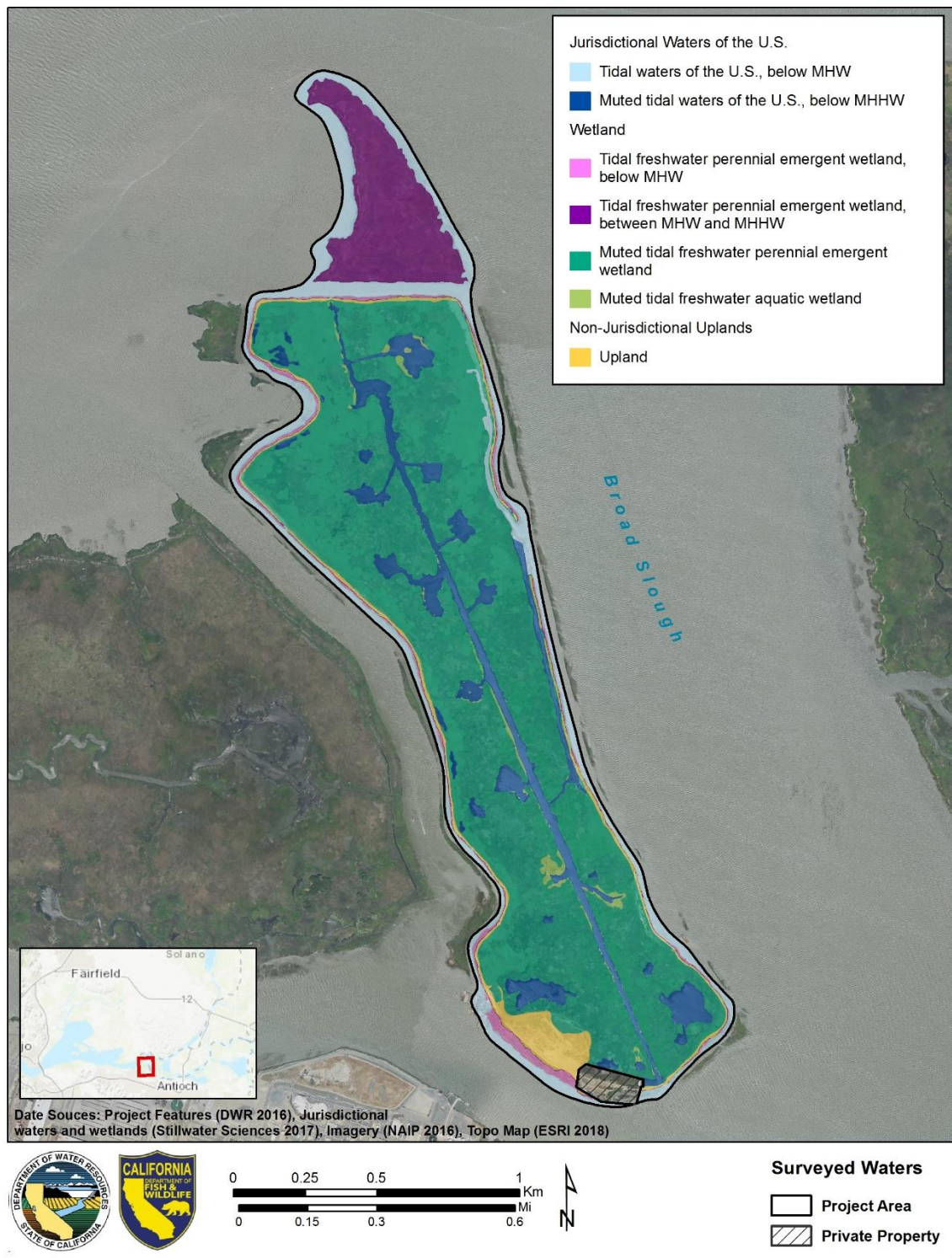


Figure 3-12. Existing water and wetland classification on Winter Island.

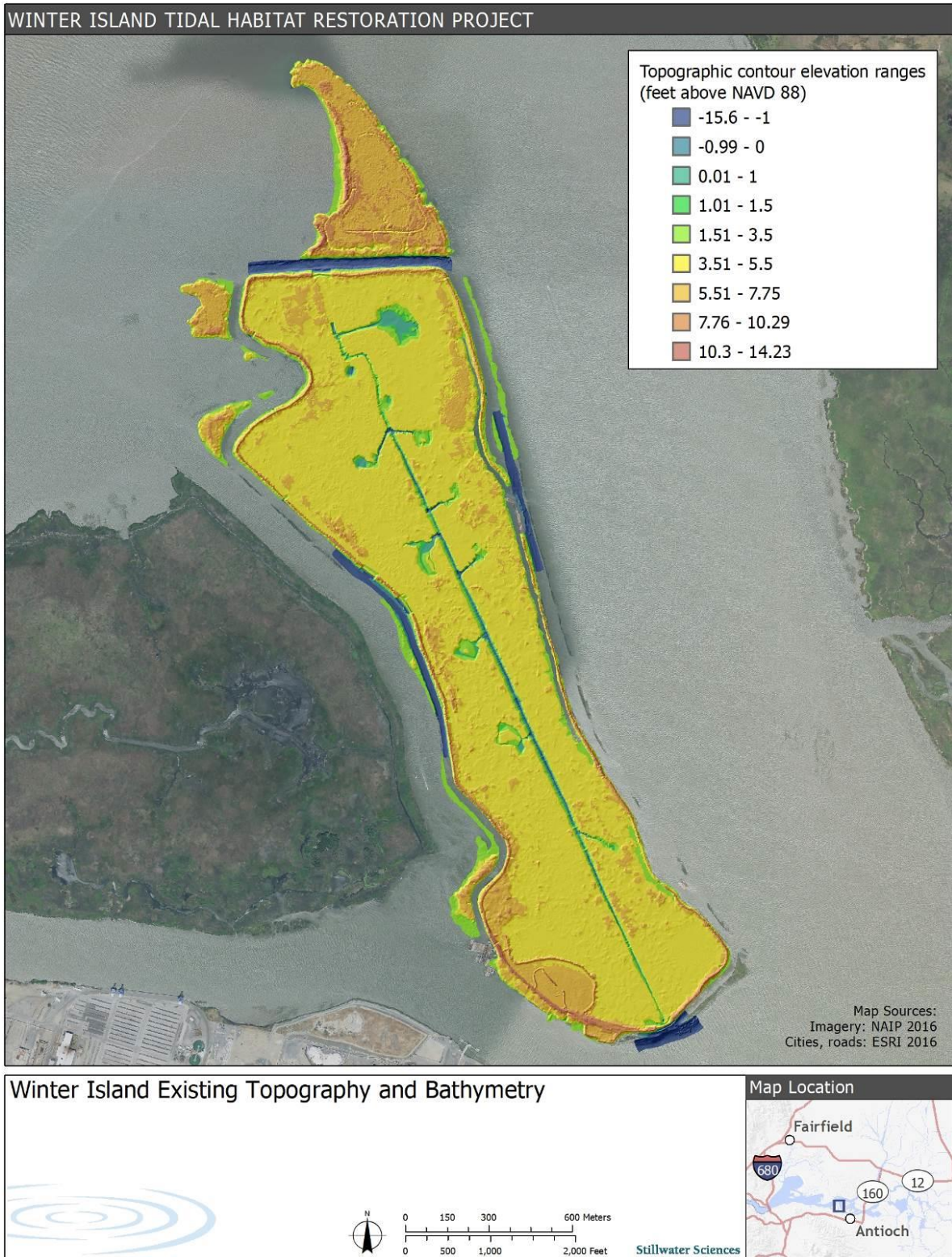


Figure 3-13. Existing Winter Island topography and bathymetry

3.9.2 Discussion

a) Violate any water quality standards or waste discharge requirements?

Less than significant with mitigation incorporation

Turbidity

Removing the northern and southern water control structures, creating a 100-foot wide breach at the southern end of the island, and widening the existing eastern tidal channel would increase tidal regime on the island. These proposed activities would require excavation in water, even at low tide, and could cause elevated turbidity levels inside of Winter Island, in Broad Slough, New York Slough, and the Sacramento and San Joaquin Rivers. While a silt curtain, or a similar turbidity control method, would be used at construction locations as necessary to control suspended sediment, there would still be potential to temporarily increase turbidity in the immediate vicinity of the construction locations. Mitigation measure WQ-1 incorporates minimization measures that would limit construction impacts to turbidity; impacts would be less than significant with this mitigation incorporated.

Mitigation Measure WQ-1: Minimize Construction Related Turbidity

To minimize turbidity impacts to water quality, the following BMPs shall be implemented for all phases of the Project:

- A silt curtain or similar turbidity control method may be installed and maintained outside of the northern and southern breach construction areas, as necessary, to control the release of suspended sediments. Turbidity would be monitored upstream and downstream of construction sites as necessary.
- If turbidity thresholds set by regulatory agencies are exceeded, work would be halted until levels return to an acceptable level.
- In-water work shall be scheduled to occur during low and incoming (flood) tide and equipment shall excavate towards the island interior where feasible.
- Vegetation shall be left in place and undisturbed to the extent possible.
- Upon completion of construction, exposed upland areas would be seeded with native vegetation.

Methylmercury

Under the Delta Mercury Control Program (DMCP) established by the Central Valley Regional Water Quality Control Board (CVRWQCB), DWR is required to develop measures to control the discharge of methylmercury (MeHg) from wetlands. However, the role of tidal wetlands on MeHg production is relatively unknown. In order to evaluate the import and export of MeHg, DWR is completing a compliance study under the DMCP to determine if a) particular wetlands are a net source or sink of methylmercury on a daily, monthly, and annual basis, b) if MeHg imports or exports are greater during a particular season, and c) if organic carbon and MeHg concentrations are positively correlated. Data collection began at the Yolo Wildlife Area Tidal Wetland in 2014 for one year, continued at Blacklock Tidal Wetland in Suisun Marsh the following year, then at Lindsey Slough in the Cache Slough Complex the year after, and will be completed at the Cosumnes Floodplain Mitigation Bank owned by Westervelt Ecological

Services. Preliminary results from the Yolo Wildlife Area, a freshwater tidal wetland with one opening connected to the toe drain of the Yolo Bypass, suggests that MeHg exported from a wetland is negligible to non-existent. The Yolo Wildlife area was often a sink for total mercury and always for MeHg during the sampling events. During the few events when the wetland was a source of total mercury, it was generally in the particulate fraction (DWR 2015).

Research conducted in other estuaries suggest tidal wetlands are a relatively small source of methylmercury. A study conducted at Kirkpatrick Marsh, a tidal saltmarsh adjacent to the Chesapeake Bay, found that, though the marsh may be a source of methylmercury, it is likely that the overall annual load from the marsh source is minor since the amount of tidal marsh coverage within the region is small when considering the Chesapeake Bay area as a whole (Mitchell et al. 2012). Similarly, Winter Island could become a source of methylmercury, but inputs would likely be insignificant when considering the size of San Francisco Estuary.

Like other restored wetlands, Winter Island Tidal Habitat Restoration Project has potential to increase MeHg availability in the aquatic food web; however, this is not expected, as pre- and post-restoration conditions would be very similar. High marsh habitat, which floods less frequently and fully dries out, generally contains higher concentrations of MeHg, while tidal habitat that does not fully dry tends to have lower concentrations of MeHg (Hall et al. 2008). The restoration would increase the tidal regime, but would only slightly increase the amount of high marsh habitat on site. Due to limited upland habitat on site, the increase in mean higher high water would only convert 0.29 acres of upland into high marsh habitat. While the amount of MeHg produced on site is not expected to significantly change, it is possible that the increased tidal regime could export methylmercury off site into the surrounding open water. However, when considering the size of the San Francisco Estuary and other sources of methylmercury, impacts would be less than significant.

Salinity

Salinity modeling for Winter Island was completed by Resource Management Associates using the most recent version of the RMA Delta model (RMA 2015, Appendix H). Electrical conductivity (EC) was used as a surrogate for salinity, and modeling was performed for May through November of 2009 (below normal / dry / critically dry conditions) and 2013 (dry and critically dry conditions) for two-breach (existing eastern breach and southern end breach) and three-breach (east, north and southern end breach) restoration design alternatives. Models were applied to existing and post-restoration bathymetry (Base-1 grid and Base-2 grid, respectively).

The model results were assessed on a relative basis by comparing the modeled design alternatives to the baseline elevation scenarios of the existing muted-tidal regime at eight locations: Mallard Island, Antioch, Emmaton, Jersey Point, Rock Slough, ROLD034, Victoria Canal, and SWP. In general, alternatives modeled decreased EC downstream of Winter Island, and increased EC upstream of Winter Island. The modeled alternatives would result in increases and decreases of EC dependent on the location and water year type, with the largest increases in the San Joaquin River near Antioch and Jersey point, and in False River. For the

Base-1 grid 2009 and 2013 monthly EC average models, all modeled EC changes were less than 0.9% for both design configurations (see Tables 2 and 6 of RMA 2015). For the Base-2 grid 2009 monthly EC average model, all modeled EC changes were less than 1.3% for both design configurations (see Table 4 of RMA 2015). The Base-2 grid 2013 monthly EC average model predicted the highest EC changes, of up to 1.88% during May at Antioch (see Table 8 of RMA 2015). The larger EC changes for the Base-2 scenarios are attributed to the lower marsh plain elevations. The larger modeled EC changes in 2013 are attributed to the overall dryer water year type.

Water Rights Decision 1641 (D-1641) (SWRCB 2000) is part of SWRCB's implementation of the 1996 Bay-Delta Plan, and is considered the relevant water quality standard to assess in terms of salinity impacts. D-1641 contains Agricultural Beneficial Use standards for Sacramento River at Emmaton and San Joaquin River at Jersey Point—a 14-day running average EC of 4500 microsiemens (uS)/cm is required to be achieved from April 1 through to June, July, or August dependent on the water year type. Base ECs at Emmaton and Jersey Pt during dry to critically dry water years (2009 and 2013) are all below 2,000 uS/cm (RMA 2015), and the modeled alternatives would not cause Agricultural Beneficial Use standards to be exceeded, or to near exceedance. D-1641 also contains Municipal and Industrial Beneficial Use standards for San Joaquin River at Antioch Water Works Intake that require a maximum mean daily Chloride (Cl) concentration of 150 mg/L for a specified number of days per year, dependent on the water year type. Mean Base Cl concentrations for the modeling periods at Antioch are well above the 150 mg/L standard, ranging from 746 mg/L to 845 mg/L. Small increases of Cl concentrations at Antioch would not cause further non-compliances with D-1641 Municipal and Industrial Beneficial Use standards. Lastly, although the alternatives modeled differ slightly from the Proposed Project, which includes southern and northern breaches, because the tidal prism of Winter Island is small and the modeled EC showed decreases or only small increases for two different design alternatives (all < 2%), salinity change from implementation of the Proposed Project would not have any substantial adverse effects on beneficial uses of water.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted?)

No Impact

The Project does not include groundwater pumping nor would it interfere with groundwater recharge; therefore, no impact would occur.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?

Less than significant

The Project would slightly alter the drainage pattern by increasing tidal connectivity between the Project area and surrounding waterways. Hydrodynamic modeling shows peak velocities at the breach points and in the eastern channels would be around 3-5 feet per second (Appendix F), just enough to maintain the tidal channels clear of fine sediment (Fischenich 2001). The southern breach point would experience the highest hydraulic energy and would be armored with existing rip-rap to protect against erosion. Impacts would be less than significant.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site?

No impact

The Project would not alter the drainage pattern of the site or area in a way that would increase the rate of surface runoff or substantially alter the course of the Sacramento and San Joaquin Rivers; therefore, there would be no impact.

e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less than significant

The Project would not contribute runoff water that would exceed a stormwater drainage system capacity. Construction would occur during the dry season (August-October), and restrictions associated with the Storm Water Pollution Prevention Plan (SWPPP) would be in place during all phases of construction. There would not be a significant source of polluted runoff; therefore, impacts would be less than significant.

f) Otherwise substantially degrade water quality?

Less than significant

As discussed in a), c), and e) above, the Project is not expected to cause significant impacts to discharge standards, erosion, siltation, or other pollutants during or after construction. There may be short-term temporary turbidity impacts from construction, but these would be relatively small scale and mitigated by construction standards (Mitigation Measure WQ-1) and a SWPPP. The Project would not substantially degrade water quality; therefore, impacts would be less than significant.

g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate map or other flood hazard delineation map?

No impact

The Project would not construct any houses; therefore, there would be no impact.

h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?

No impact

The Project would not construct any structures; therefore, there would be no impact.

i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

No impact

The property adjacent to the Project area, owned by Winter Island Farms, houses a duck hunting clubhouse and a few associated structures. However, these structures are not inhabited year-round and are located on upland. Furthermore, the closest proposed Project feature, the southern breach, would be armored with rip-rap to prevent erosion and be located 200 feet away from the property line. The Project would not expose people or structures to significant loss, injury, or death as a result of flooding; therefore, there would be no impact.

j) Contribute to inundation by seiche, tsunami, or mudflow?

No impact

The Project would not affect the risk for seiche, tsunami or mudflows; therefore, there would be no impact.

3.10 Land Use and Planning

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Physically divide an establish community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (Including but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

3.10.1 Environmental Setting

The Project is located in northern Contra Costa County. The Contra Costa County General Plan (2005) zones the island as agricultural lands, though the Contra Costa County Important Farmland map (2016) classifies it as “other land” that is not important to farming or agriculture. The designation as agricultural lands in the general plan likely stems from the island’s historic use as small-scale local farmland, though it has not been used for farming in over 100 years. Winter Island soils are Joice muck, which is acidic, regularly inundated, and not ideal for growing crops. Furthermore, the General Plan states that the designation of agricultural lands “shall not be used to exclude or limit other types of agricultural, open space or non-urban uses” and therefore, altering the site to allow full tidal flow would not conflict with the current land use designation.

Delta Plan

The Delta Plan is a comprehensive, long-term management plan for the Delta. Required by the 2009 Delta Reform Act, it creates new rules and recommendations to further the State’s co-equal goals for the Delta: Improve statewide water supply reliability, and protect and restore a vibrant and healthy Delta ecosystem, all in a manner that preserves, protects and enhances the unique agricultural, cultural, and recreational characteristics of the Delta. Specifically, the following policies and recommendations are applicable to the project:

- GP1: Mitigation Measures, Best Available Science, and Adaptive Management Plan
- ER P2: Restore habitat at appropriate elevations.
- ER P5: Avoid introductions of and habitat improvements for invasive nonnative species.
- DP P2: Avoid conflicts with adjacent land uses

The Delta Land Use and Resource Management Plan (2010) established policies for the Delta in order to protect and enhance the existing land use in the Primary Zone for local agencies. This plan and the subsequent policies do not apply to State agencies.

Delta Protection Commission

The Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta is a long-term management plan to protect, maintain, enhance, and restore, where possible, the overall quality of the Delta environment. This includes agriculture, wildlife habitat, and recreation, and attempts to balance conservation and development within the Delta. The Management Plan outlines goals for land use, agriculture, natural resources, recreation and access, water, levees, and utilities and infrastructure.

3.10.2 Discussion

a) Physically divide an established community?

No impact

There are no communities established on Winter Island for the Project to divide; therefore, there would be no impact.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

No impact

The Project would not conflict with the Delta Plan or the Delta Protection Commission's long-term management plan. The Project area is at an appropriate elevation for restoration, would exclude habitat conducive to invasive nonnative species, and would be located within the prioritized area of the Delta.

The Project area is zoned as agricultural lands and other lands, though the existing conditions are muted tidal wetlands. The Contra Costa County General Plan agricultural lands classification allows for other types of open space. The Project would not change existing land uses on the site or conflict with land use plans; therefore, there would be no impact.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No impact

Though Contra Costa County has a Habitat Conservation Plan (HCP), Winter Island lies outside of the HCP's boundaries. Therefore, there would be no impact.

3.11 Mineral Resources

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				X

3.11.1 Environmental Setting

Similar to other Delta islands, Winter Island does not have any important mineral resources (Contra Costa County General Plan 2005). Nearby natural gas fields include Honker and Van Sickle Island Gas Fields, though only the Van Sickle wells are active. The DOC Division of Oil, Gas and Geothermal Resources (accessed February 2017) indicates that while there are five active gas wells on Van Sickle Island, approximately two miles northwest of Winter Island, the productivity of these wells is very low. There are additional abandoned oil wells on Browns' and Sherman Island.

3.11.2 Discussion

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No impact

The Contra Costa County General Plan shows that the Project area does not have any known mineral resources of value (2005). Furthermore, based upon Winter Island's current accessibility and the lack of sand and gravel on the island surface, the resulting loss of mineral resources from Project activities would be insignificant. It is also unlikely that Winter Island contains valuable gas and oil resources, as production at active wells nearby has declined. Therefore, there would be no impact.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No impact

There are no locally-important mineral resources that occur in the Project area (Contra Costa County General Plan 2005); therefore, there would be no impact.

3.12 Noise

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the Project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

3.12.1 Environmental Setting

Existing sources of noise near Winter Island are primarily industrial noise from the Dow chemical plant and cargo ships. The Dow Chemical plant and Delta Energy Center are located ½ mile southwest of the southern breach construction area. Deep water shipping channels are located north and south of Winter Island in New York Slough and the Sacramento River.

Sensitive receptor areas, such as residential areas, schools, and hospitals, would be the main causes of concern for exposure to an increase in noise (City of Pittsburg 2001). Winter Island Farms LLC has a duck hunting clubhouse on Winter Island adjacent to the southern breach location and is the closest to what would be considered a sensitive receptor. The closest residential areas are approximately 1.5 miles away from Winter Island to the south across New

York Slough and Collinsville to the north across the Sacramento River. Southeast of Winter Island is the Dow Wetland Preserve, which is the only publicly accessible area near the southern construction area. The island is surrounded by uninhabited wetlands to the east, west, and north.

Noise is measured in decibels (dB), and the A-weighted scale (dBA) is the most common metric to quantify changes. A whisper is about 30 dBA, normal speaking is about 60 dBA, and a shout is 100 dBA. Long term exposure to noise levels exceeding 70 dBA can cause permanent damage to hearing and could be considered a threshold for impacts. Equipment that would be utilized for construction (excavators, cranes, tug boats) would have noise levels ranging from 80-85 dB when observed from 50 feet away. Sound levels typically decay by 6 decibels for each doubling of distance beyond the recording location (U. S. Department of Transportation 2006).

3.12.2 Discussion

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than significant

Winter Island is not within close proximity to any sensitive receptor as it is mostly surrounded by uninhabited wetland. The Winter Island Farms LLC clubhouse is the closest receptor that could be considered a sensitive receptor; though it is not a permanent residence and is not occupied year-round. During the construction phase, there would be a temporary increase in noise near construction sites during daylight hours. Noise from construction activities would be observed between 80-85 dB from 50 feet away. The Winter Island Farms LLC property line is 200 feet away from the southern breach location, though the closest dwelling is about 800 feet away. Sound levels experienced at the property line would be about 50 dB, below the threshold for potential hearing damage and below the noise level of a normal conversation.

In accordance with the City of Pittsburg noise policies 12-P-9 and 12-P-10 (City of Pittsburg 2001), construction would be restricted to normal business hours between 08:00- 17:00. Construction noise would not conflict with noise ordinances and would be less than significant.

b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Less than significant

The closest dwelling, the Winter Island Farms LLC clubhouse, would be 800 feet away from construction at the southern breach location. Ground-bore vibration and noise levels would be substantially diminished at that distance. Impacts would be less than significant.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the Project?

No impact

Upon Project completion, the restored tidal wetland would not produce more noise than it currently does; therefore, there would be no impact.

d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?

Less than significant

Noise generated from construction equipment would occur during normal daylight hours (08:00-17:00) in accordance with the City of Pittsburgh General Plan (2001). Noise levels beyond the immediate construction area would be noticeable but greatly diminished. Impacts would be less than significant.

e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No impact

The Project is not located within an airport land use plan or within two miles of a public airport or public use airport; therefore, there would be no impact.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No impact

The Project is not within the vicinity of a private airstrip; therefore, there would be no impact.

3.13 Populations and Housing

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

3.13.1 Environmental Setting

The Project area is on an island without vehicular access and can only be reached by boat. A duck hunting clubhouse adjacent to the Project area is periodically occupied on a short-term basis for recreational use; however, no year-round residents live on the island. Winter Island is zoned as agricultural/other by Contra Costa County (See Section 3.10 Land Use and Planning) and primarily consists of freshwater marsh habitat (Contra Costa County General Plan 2005; Contra Costa County Important Farmland Map 2016). Upon Project completion, the area would be preserved and protected from residential development in perpetuity.

3.13.2 Discussion

a) Induce substantial population growth in an area, either directly (for example by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No impact

The Project would not result in the creation or extension of new homes, residential units, businesses, or other infrastructure; therefore, there would be no impact.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No impact

Winter Island does not have any existing residential housing; therefore, there would be no impact.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No impact

The Project would not displace any people as there is no housing in the Project area; therefore, there would be no impact.

3.14 Public Services

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
a) Fire protection				X
b) Police protection				X
c) Schools				X
d) Parks				X
e) Other public facilities				X

3.14.1 Environmental Setting

Winter Island is located within an unincorporated portion of Contra Costa County, just north of Pittsburg, California (CCMAP 2017). It is serviced by the Contra Costa County Fire Protection District and the Contra Costa County Sheriff's Department (Contra Costa County General Plan 2005). Reclamation District 2122 was formed on Winter Island in 1982.

3.14.2 Discussion

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:

a) Fire protection

No impact

Winter Island primarily consists of freshwater marsh. The proposed Project would improve access to the internal portion of the Island and would not pose an additional fire risk; therefore, there would be no impact.

b) Police protection

No impact

The Project area would continue to be serviced by the Contra Costa County Sheriff's Department and there would be no new protection needed; therefore, there would be no impact.

c) Schools

No impact

There are no schools or residential units within the Project area and no new facilities would be built as part of the Project; therefore, there would be no impact.

d) Parks

No impact

There are no parks in the Project area; therefore, there would be no impact.

e) Other public facilities

No impact

There are no public facilities in the Project area; therefore, there would be no impact.

3.15 Recreation

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X
c) Will the Project affect established recreational activities, either permanently or temporarily, in the area including, but not limited to, fishing, duck hunting, recreational boating, or water sports?			X	

3.15.1 Environmental Setting

There is a private duck hunting clubhouse located on Winter Island, adjacent to but outside the Project area, that would continue to be used as a clubhouse during and after the Project is completed. While recreational opportunities would not be developed as part of the Project, or otherwise encouraged, the Project would increase access to the island's interior as it would create a navigable waterway.

3.15.2 Discussion

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No impact

There are no neighborhoods, parks, or public recreational facilities within the Project area; therefore, there would be no impact.

b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No impact

The Project does not include recreational facilities; therefore, there would be no impact.

c) Will the Project affect already established recreational activities, either permanently or temporarily, in the area including, but not limited to fishing, duck hunting, recreational boating, or water sports?

Less than significant impact

Fishing, waterfowl hunting, and watersports like kite surfing are known to occur in the waters in and around Winter Island. During construction, recreational activities like fishing and hunting may be temporarily impacted near construction sites. Construction machinery may interfere with fishing opportunities by their presence in waterways and through construction related noise. However, the construction area is relatively small, and fishermen would have an abundance of quality habitat nearby that can be utilized for fishing.

Waterfowl hunting may be temporarily impacted from construction activities, though it is not expected. While the work window for construction activities (September 1 through October 31) extends into waterfowl hunting season (October 21 through January 28), construction is not expected to take the full two-month construction window. However, unforeseen or unexpected circumstances, like equipment malfunctions, may delay the completion of construction. If that were to occur, waterfowl hunting activities may be temporarily discouraged in an effort to protect the construction crews and general public from accidents. These safeguards would be in place for no more than 10 days until the construction season closes on October 31.

After construction, Winter Island would have greater access for use by recreational hunters and fishermen. These activities would not be discouraged, but there would be no formal hunting or fishing management program for the property. Impacts would be less than significant.

3.16 Transportation and Traffic

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Exceed the capacity of the existing circulation system, based on applicable measures of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b) Conflict with an applicable congestion management program, including but not limited to, level of service standards and travel demand measures and other standards established by the county congestion management agency for designated roads or highways?			X	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?				X
f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

3.16.1 Environmental Setting

There are no roads or public vehicle access on Winter Island; the island is only accessible by boat. There are no DWR owned docks or structures; however, one dock exists along the southern end of the island on property owned by Winter Island Farms LLC. During Project construction, equipment and materials would be transported to the island by barge and staged on the barge. Barges would be floated by tugboat, either downstream or upstream depending on their origin. Two barges would be utilized for construction and one utilized for disposal of

debris and construction material at a Class II or Class III Landfill, depending upon local regulations. The barge would be anchored along the shoreline when not in use.

Construction personnel would arrive by car to the Pittsburg marina via Highway 4 and would be shuttled to Winter Island by boat. Traffic generated by workers accessing the boat shuttle would be less than 20 car trips per day

3.16.2 Discussion

a) Exceed the capacity of the existing circulation system, based on applicable measures of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less than significant

The only on-road traffic generated would be initial mobilization of equipment onto barges, daily construction worker access to boat docks, and demobilization of equipment. Impacts to the circulation system would be less than significant.

b) Conflict with an applicable congestion management program, including but not limited to, level of service standards and travel demand measures and other standards established by the county congestion management agency for designated roads or highways?

Less than significant

Mobilization of construction personnel is not expected to create any adverse impact since construction crews would be small (less than 20 vehicle trips per day) and supplies and equipment would arrive by barge and would be left on or offshore of Winter Island. Congestion impacts would be less than significant.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No impact

The Project would not include the use of any aircraft or the construction of airports; therefore, there would be no impact.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No impact

No transport design features need to be constructed for the Project. There would be no changes to existing public roads or permanent vehicular access to Winter Island; therefore, there would be no impact.

e) Result in inadequate emergency access?

No impact

The Project would be restored to tidal wetland habitat with no roads. The restoration of tidal wetland habitat does not change or block any emergency access routes; therefore, there would be no impact.

f) Conflict with adopted policies, plans or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

No impact

The temporary barge and boat required for construction would not conflict with alternative transportation options; therefore, there would be no impact.

3.17 Tribal Cultural Resources

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
Cause a substantial adverse change in the significance of a tribal cultural resources, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources or in a local register of historical resources as defined in Public Resources Code 5020.1(k), or				X
c) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1 the lead agency shall consider the significance of the resource to a California Native American tribe.				X

3.17.1 Environmental Setting

CEQA requires California lead agencies to consider a project's potential to affect tribal cultural resources (as defined by Public Resources Code 21074) and to also consult with California Native American Tribes (as defined by Public Resources Code 21073) on proposed projects if (1) the tribe has requested to the lead agency, in writing to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe and (2) the California Native American tribe responds, in writing within 30 days of receipt of the formal notification, and requests the consultation (Public Resources Code 21080.3.1).

Native American Outreach

The Native American Heritage Commission maintains a list of California Native American Tribes as well as a database of known sacred sites. DWR requested and received a sacred lands file search and a list of tribes affiliated with the project area in October 2016 and an updated search

and contact list was provided for the project area in March 2018. Of the six tribes that the Native American Heritage Commission lists as traditionally and culturally affiliated with the Project area, only one (Wilton Rancheria) has requested formal notification from DWR of proposed projects that occur in the vicinity of Winter Island as specified under Public Resources Code 21080.3.1(b).

DWR sent written invitations to consult under California Natural Resources Agency's and DWR's Tribal Engagement Policies to all six tribes on the Native American Heritage Commission contact lists on January 18, 2017 (see list under Cultural Resources section for details). These letters included a request for any information that the tribe was willing to share about potential Tribal Cultural Resources in or near the project area. Additionally, the letter addressed to Wilton Rancheria Chairman Raymond Hitchcock included a formal notification and invitation to consult pursuant to AB-52 and Public Resources Code 21080.3.1. The letter to Chairman Hitchcock was returned due to an addressing error and was sent out again via certified mail on February 6, 2017.

DWR received a letter to consult on the project under Public Resources Code 2180.3.2. The letter was dated March 1, 2017 but was postmarked March 23, 2017. The postmarked response fell outside the 30-day window to request consultation specified under Public Resources Code 2180.3.1(d); however, DWR is committed to continued communication with the tribe under the California Natural Resources Agency's Tribal Engagement Policy and DWR's Tribal Engagement Policy. A meeting with the tribe is planned.

3.17.2 Discussion

Would the Project cause a substantial adverse change in the significance of a tribal cultural resources, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources or in a local register of historical resources as defined in Public Resources Code 5020.1(k)?

No impact

No Tribal Cultural Resources were identified through communication with California Native American Tribes, and no prehistoric or Native American archaeological resources of potential value to California Native American Tribes were identified during the pedestrian survey of the project area (see Cultural Resources Section for details). In the unlikely event that prehistoric archaeological materials are encountered during construction, work would stop within 100 feet until a qualified archaeologist evaluates whether the find is eligible for listing in the California Register of Historical Resources or in a local register of historical resources as defined in Public Resources Code 5020.1(k) as per mitigation measure CR-2. Tribal contact would also be initiated for any unanticipated prehistoric discovery.

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1 the lead agency shall consider the significance of the resource to a California Native American tribe?

No impact

No Tribal Cultural Resources were identified through communication with California Native American Tribes, and no prehistoric or Native American archaeological resources of potential value to California Native American Tribes were identified during the pedestrian survey of the project area (see Cultural Resources Section for details). In the unlikely event that prehistoric archaeological materials are encountered during construction, work would stop within 100 feet until a qualified archaeologist can evaluate the find as per mitigation measure CR-2. Tribal contact would also be initiated for any unanticipated prehistoric discovery.

3.18 Utilities and Service Systems

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve from existing entitlements and resources, or would new or expanded entitlements be needed?				X
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
g) Comply with federal, state, and local statutes and regulation related to solid waste?				X

3.18.1 Environmental Setting

The Project would not generate wastewater or require the use of a wastewater treatment facility.

3.18.2 Discussion

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

No impact

No wastewater would be generated by the Project; therefore, there would be no impact.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No impact

The Project would not impact current wastewater treatment facilities. There would be no impact.

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No impact

No new drainage facilities would be installed for the Project; therefore, there would be no impact.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?

No impact

The Project would not affect existing water entitlements; therefore, there would be no impact.

e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No impact

The Project would not require consultation with a waste water treatment provider; therefore, there would be no impact.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Less than significant

The Project would remove and dispose of existing junk and debris during construction. This material would be disposed of at a Class II or Class III Landfill, depending upon local regulations. The volume of solid waste disposal would not exceed a landfills capacity.

h) Comply with federal, state, and local statutes and regulations related to solid waste?

No impact

The Project would not be expected to generate solid waste; therefore, there would be no impact.

3.19 Mandatory Findings of Significance

Environmental Factors and Focused Questions for Determination of Environmental Impact	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or eliminate important examples of the major periods of California history or prehistory?		X		
b) Does the Project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" meant that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of the other current projects and effects of probable future projects)?			X	
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			X	

3.19.1 Discussion

a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or eliminate important examples of the major periods of California history or prehistory?
Less than significant with mitigation incorporation

The Project would temporarily impact aquatic and upland habitats within the Project area; however, it is unlikely that these impacts would cause significant changes to special status species populations or communities, or restrict their distribution. Construction related disturbance would be short in duration and any impacts would be reduced to less than significant levels by implementing the measures outlined in the previous sections. Fish and wildlife are expected to benefit from the Project, as tidal influence would be restored to the

interior portions of Winter Island, improving aquatic access and the exchange of primary and secondary productivity with the surrounding waterways.

The Project is unlikely to impact any significant cultural or historical resource. The Project would remove water control structures and small sections of levee, neither of which are considered culturally or historically significant.

b) Does the Project have impacts that are individually limited but cumulatively considerable? (“Cumulatively considerable” meant that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of the other current projects and effects of probable future projects)?

Less than significant

Project specific impacts would predominately be short term, construction related impacts. These impacts would be reduced to less than significant levels through avoidance measures, minimization measures, and construction best management practices. Temporary impacts to the wetland habitat would recover relatively quickly, and an overall beneficial change to tidal habitat would be achieved.

When considered over a large geographical extent and in conjunction with future restoration projects, there is potential for impacts to water quality to be cumulatively considerable. Restoration projects tend to increase the volume of water in the San Francisco Bay-Delta Estuary, and as freshwater aquatic habitat increases, there is potential for saltwater intrusion to extend further into the Delta. Excessive saltwater intrusion into normally freshwater habitat would pose a risk to agriculture and urban drinking water supplies.

Salinity modeling was completed for Winter Island by Resource Management Associates (2015) using the most recent version of the RMA Delta model (Appendix H). The model run included Prospect Island and compared several Winter Island alternatives and base conditions. Results were presented in absolute and percent change from base EC at Mallard Island, Emmaton, Antioch, Jersey Point, the State Water Project intake, and the Contra Costa Water district intakes at Rock Slough, Old River, and Victoria Canal. Even with Prospect Island and Winter Island cumulatively considered, changes to base EC were less than 2% in the most extreme case (critically dry conditions, summer months), and there would be no violations of existing water quality objectives for EC as set in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

As specified in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (SWRCB 2006) and the Revised Water Right Decision 1641 (SWRCB 2000), DWR, as well as other water rights permit holders, are responsible for protecting estuarine water quality for municipal, industrial, and agricultural use, as well as fish and wildlife protection. Water quality conditions at set locations are regularly monitored by DWR and the United States Bureau of Reclamation (USBR) to ensure adherence to location-specific objectives. Real-time monitoring can inform water system operational decisions and prevent

exceedances in water quality standards. Though, in combination, tidal wetland restoration projects have the potential to cause some changes to regional salinity, DWR would continue to monitor water quality, make changes to water management, and implement salinity control actions as necessary to adhere to water quality standards. Overall, Project-related impacts would not result in cumulatively significant impacts to the San Francisco Estuary system when considering Project modeling results, current water management practices, and other projects that have occurred/may occur in close proximity to Winter Island.

c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than significant

Construction of the proposed Project could result in temporary impacts to human beings, including increased noise disturbance and possible exposure to contaminants if an accidental spill were to occur. However, Winter Island is isolated from populated areas and only accessible by boat, therefore impacts are unlikely. Furthermore, the implementation of construction best management practices would ensure that any potential impacts are less than significant.

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